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ABSTRACT

This is the teacher's manual to accompany part 1 of the workbook for grade 4 pupils in the Comprehensive Instructional Management System, a teacher-designed unified mathematics curriculum for kindergarten through grade 7. It is composed of a curriculum, a testing component, and a computer-managed reporting system. The curriculum is organized into modules of similar skills or understandings from 14 topics. Each module has: a suggested period of duration for student mastery; a listing of new skills to be mastered by the student in the form of performance objectives; a section devoted to vocabulary, terms, and symbols; getting-started activities on prerequisite skills in preparation for undertaking new objectives; strategies for teaching the new skills; and student activities for providing reinforcement for the newly learned objective. After the sequence of modules and content by topic are displayed, teaching suggestions for 86 modules on 73 performance objectives are given. The content is from the topics of: numbers and numeration; addition; subtraction; fractions; multiplication; division; fractions; decimals; integers; geometry; measurement; algebraic concepts; graphs, probability, statistics; and problem solving, plus review. Pages from the student's workbook are interspersed with the suggested activities. (MNS)

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CIMS

COMPREHENSIVE INSTRUCTIONAL MANAGEMENT SYSTEM

A Cyclical Mathematics Curriculum

PART 1—TEACHER

SE 045 521

NEW YORK CITY BOARD OF EDUCATION
OFFICE OF CURRICULUM DEVELOPMENT AND SUPPORT
DIVISION OF CURRICULUM & INSTRUCTION

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FOREWORD

The Comprehensive Instructional Management System (CIMS) is a unified mathematics curriculum for grades K-7. The curriculum is cyclical in design, and reflects the most recent New York City and New York State guidelines.

Utilizing the experience of our system's teachers, we have developed a teacher-designed curriculum that includes a rich selection of classroom-tested successful mathematics activities. The major goal of the CIMS mathematics project is to provide the classroom teacher with a well-structured, objective-based curriculum. All objectives are supported by a variety of strategies. Student mastery of these objectives is readily diagnosed through the system's testing component.

The curriculum format is structured to allow the teacher to determine the ability level of the students in the topic under study, and to permit the students to move forward at their individual rates. Each module of instruction provides the teacher with a set of related performance objectives. These objectives are supported by activities which probe and develop the students' readiness to undertake new skills and concepts. Further reinforcement is given to mastery of the objectives through accompanying student workbooks.

It is hoped that this curriculum will not only assist teachers in developing vital mathematics instruction, but will serve to expand and enrich students' mathematics skills.

Charlotte Frank

Charlotte Frank,
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ACKNOWLEDGMENTS

The Comprehensive Instructional Management System (CIMS) was developed as a project of the Division of Curriculum and Instruction, Charlotte Frank, Executive Director. Dr. Peter Negroni, Community School Superintendent CSD 12; Dr. Harvey Garner, Community School Superintendent CSD 18; Carlos Edwards, Community School Superintendent CSD 23, and Joseph Pacheco, Community School Superintendent CSD 32 supervised the overall development of the CIMS program within their respective districts.

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INTRODUCTION

The Comprehensive Instructional Management System (CIMS) is a teacher-designed educational delivery system composed of a curriculum, a testing component and a computer managed reporting system.

Designed to support mathematics instruction in the classroom, CIMS provides a comprehensive cyclical mathematics curriculum for grades K through 7. Each manual describes the curriculum for a single level or grade. Teacher curriculum developers from elementary, intermediate and senior high schools utilized the most current New York City and New York State guidelines in formulating the curriculum's modules and sequence.

Curriculum Topics

The CIMS mathematics curriculum has been organized into the following 14 topics:

.01 Numbers and Numeration
.02 Addition of Whole Numbers
.03 Subtraction of Whole Numbers
.04 Multiplication of Whole Numbers
.05 Division of Whole numbers
.06 Fractions
.07 Decimals
.08 Integers
.09 Geometry
.10 Measurement
.11 Algebraic Concepts
.12 Graphs, Probability, Statistics
.13 Problem Solving
.14 Review

Modules of Instruction

The CIMS curriculum is organized into modules or groupings of similar skills or understandings. Each module has a suggested period of duration for student mastery, a listing of new skills to be mastered by the student in the form of performance objectives, a section devoted to vocabulary, terms and symbols, getting started activities which serve as prerequisite skills in preparation for undertaking new objectives, strategies for teaching the new skills and student activities for providing reinforcement for the newly learned objective. Note that the lesson duration is included only as a guideline to the teacher for planning purposes. The actual time required for each module will vary from class to class and from child to child depending on the needs of the students and the teacher's judgment.

Priorities of Performance Objectives

There is an order of priority to be recognized in teaching the content presented in the CIMS NEW YORK CITY MATHEMATICS CURRICULUM. Performance objectives with the greatest priority are so basic that unless the student acquires a satisfactory degree of competency in them, the student cannot progress. Such topics are marked A and mastery by all pupils is essential.

Performance objectives marked B are required to be presented to all students. Mastery is not expected at this time. These objectives will be developed further and reinforced later.

Performance objectives marked C are of special interest. These should be taught to increase positive attitudes towards mathematics.

Summary: A - Mastery of this objective is essential for progress. Opportunities for reinforcement should be provided throughout the school year.

B - These objectives are to be taught to all pupils. Mastery is not essential at this time because the topics will be further developed and reinforced.

C - Objectives of special interest.

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Topic Tab Key

01. Numbers and Numeration

02. Addition of Whole Numbers

03. Subtraction of Whole Numbers

04. Multiplication of Whole Numbers

05. Division of Whole Numbers

06. Fractions

07. Decimals

08. Integers

09. Geometry

10. Measurement

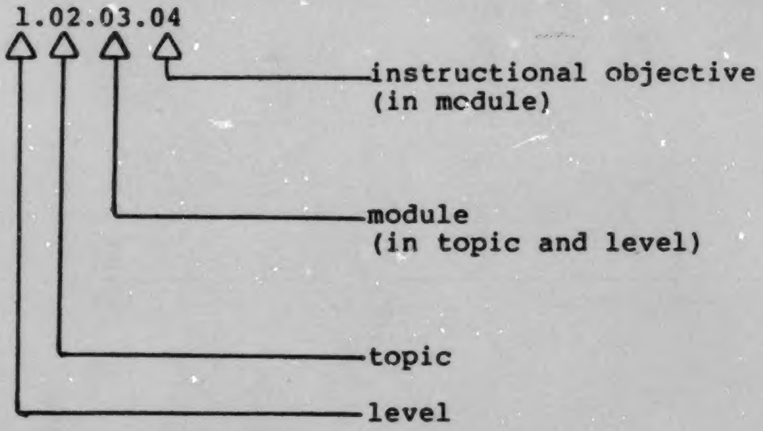
11. Algebraic Concepts

12. Graphs, Probability, Statistics

13. Problem Solving

14. Review

Module Coding Key


1.02.03.04
instructional objective (in module)
module (in topic and level)
topic
level

INSTRUCTIONAL SEQUENCE DESCRIPTION

An instructional sequence is given in list form on the following pages for this level. The sequence has been arranged to reflect what is considered the most effective presentation of the mathematics curriculum. Each module in the list is described by its unit number, module number, title, and page location.

The CIMS tests are integrated within the manual sequence. The test number is located in the first column. Each test is designed to assess priority objectives from the preceding modules. The tests are used to determine student mastery of specific performance objectives within these modules and appear in a multiple choice format. Each performance objective code number preceded by an * indicates that the performance objective is not tested on a CIMS test.

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INSTRUCTIONAL SEQUENCE - LEVEL 4

TEST NUMBER	UNIT NUMBER	MODULE NUMBER	TITLE	PAGE NUMBER
	1	4.14.01	Review basic facts	1
	2	4.13.01	Problem solving - guess and check	2
	3	4.09.01	Space figures and their properties	4
	4	4.12.01	Graphs	5
	5	4.14.02	Place value	7
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Unit 1

4.14.01 REVIEW BASIC FACTS

(ongoing)

PERFORMANCE OBJECTIVES

The student will be able to...

4.14.01.01 recall the addition facts through 18; e.g.,

$$\begin{array}{r} 4 \\ +6 \\ \hline 10 \end{array} \quad \text{or} \quad 4 + 6 = 10$$

4.14.01.02 recall the subtraction facts through 18. e.g.,

$$\begin{array}{r} 9 \\ -6 \\ \hline 3 \end{array} \quad \text{or} \quad 9 - 6 = 3$$

4.14.01

VOCABULARY

TERMS	SYMBOLS
addition	+
subtraction	-

GETTING STARTED

Divide the class into two teams. Prepare flash cards with basic addition facts through 18. Say to the teams, "As I show you a card you have 10 seconds to give the answer. For each correct answer your team gets a point." The team with the most points after a sufficient time of play wins the game.

Divide the class into two teams. Prepare flash cards with basic subtraction facts through 18. Say to the teams, "As I show you a card you have 10 seconds to give the answer. For each correct answer your team receives a point." The team with the most points wins.

4.14.01

4.14.01.01 Recall the addition facts through 18

STRATEGY 1: Prepare a tape recording of the basic addition facts through 18. There should be a 3 second interval between each fact. Ask students to number their paper from 1 -25 along the margin after folding their paper into 4 columns. At the top of each column they are to place the Roman Numerals I, II, III and IV.

e.g.,

	I	II	III	IV
1.				
2.				
3.				
4.				
.				
.				
25.				

The recording should give the students a 2- minute break after each group of twenty-five facts. Ask students to write just the answers. Play tape and check answers. Any student with a perfect paper should have his or her name placed on an "Addition Facts Masters" bulletin board in the classroom.

STRATEGY 2: Prepare rexo sheets of number families. Ask students to write the number families from 9 to 18.

e.g., Number family for 12.

12 + $\boxed{0}$ = 12
11 + ___ = 12
10 + ___ = 12
9 + ___ = 12
8 + ___ = 12
7 + ___ = 12
6 + ___ = 12
5 + ___ = 12
4 + ___ = 12
3 + ___ = 12
2 + ___ = 12
1 + ___ = 12
0 + ___ = 12

Give a time limit and test the entire class on each number family.

4.14.01

4.14.01.02 **recall the subtraction facts through 18**

STRATEGY 1: Prepare a tape recording of the subtraction facts through 18. There should be a 3 second interval between each fact. Ask students to fold their paper into 4 columns. Number each column from 1 to 25. Place a Roman Numeral at the top of each column. Play the recording. Say, "Listen carefully because no facts will be repeated".

STRATEGY 2: Prepare rexo sheets showing subtraction of number families from 7 to 18. Ask students to fill in the blanks. Time students.

e.g.,

$12 - 0 = \boxed{12}$
12 - 1 = ___
12 - 2 = ___
12 - 3 = ___
12 - 4 = ___
12 - 5 = ___
12 - 6 = ___
12 - 7 = ___
12 - 8 = ___
12 - 9 = ___
12 - 10 = ___
12 - 11 = ___
12 - 12 = ___

After checking answers with the students, do an exercise using related addition and subtraction number facts.

e.g.,

9 + 3 = 12 12 - 3 = 9

P.O. 4.14.01.01

NAME: ______________________ CLASS: ________ DATE: ______

Fill in the missing numbers for examples 1-5.

Add →

↓

1	6	7
1	0	1
2	6	8

↓

1.

1	6	7
1	0	1

↓

2.

1	0	
4	3	7
	3	8

3.

	1	
7		8
10	2	12

↓

4.

4		9
	0	
8		12

↓

5.

2		
3		13
5		15

P.O. 4.14.01.01

NAME: ________________ CLASS: ________ DATE: ________

Break the code and read the riddle.

Private Eye

5 +4	7 +4
9	11
D	O

8 +4	9 +2	11 +3

2 +0	6 +4	8 +3	0 +1

1 +0	0 +4	1 +5	6 +2

7 +5	8 +3	12 +2

11 +5	10 +1	10 +9	12 +6

11 +7	11 +6	10 +8	10 +3	9 +3

2 +6	5 +2	3 +2	11 +7

11 +1	6 +5	10 +4

13 +6	7 +1	3 +3	7 +3	5 +4

11 +3	1 +2

20 +0

12 +0	4 +7	12 +2	11 +2

10 +6	6 +0	1 +2

W	K	P	H	M	A	I	T	D	N	O	Y	R	U	F	L	V	E	S	?
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

- 1b

26

P.O. 4.14.01.02

NAME: ____________ CLASS: ____________ DATE: ____________

Break the code and read the riddle.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
?	M	K	L	S	D	C	W	Y	U	E	N	F	T	I	R	O	H	A

W	H	E	R	E
7 -1	17 -1	10 -5	15 -10	10 -9
6	16	5	5	1

-1	-9	-10
5	9	1

-1	-8	-8
7	8	1

-8	-3	-3	-10	-2	-2
10	0	4	8	6	2

-4	-7	-3	-2
8	7	8	3

-1	-7	-4	-9	-3
0	9	7	1	5

-5	-9	-2	-5
2	8	8	6

-8	-6	-4
0	10	5

-0	-8	-5	-1
3	8	11	1

-3	-4	-7
9	12	8

-9	-9
5	4

-0
0

-8	-6
6	5

-7	-8	-0
6	9	10

-5	-8	-0	-8	-3	-4	-8	-5	-9	-0
0	6	6	5	11	12	3	13	6	8

PRIVATE EYE

- 1c -

4.13.01 PROBLEM SOLVING - GUESS AND CHECK

(2-3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.13.01.01 check guesses against problem conditions in addition problems;

e.g.,

Can you make a magic square? Using the digits 1 through 9 only once, arrange them so that every row, every column, and each diagonal adds up to 15.

e.g.,

4	3	8
9	5	1
2	7	6

4.13.01.02 check guesses against problem conditions in place value problems;

e.g.,

What is the number?

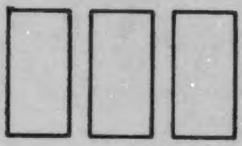
- It is a three-digit number.
- It is an odd number.
- It reads the same forwards and backwards.
- The sum of the digits is 5.

4.13.01.03 check guesses against problem conditions in multiplication problems.

e.g.,

What numbers are on these 3 cards?

- Each number is less than 10.
- Each number is different.
- There are no even numbers.
- The sum of the three numbers is the same as the product of two of the numbers.



VOCABULARY

TERMS

estimate
guess
conditions

GETTING STARTED

Prepare a quantity of coins, several in each denomination, e.g., 5¢, 10¢, 25¢... Place two quarters and four dimes in one of your hands. Say, "I have 6 coins in my hand. Their total value is $.90. Who would like to try to guess what these coins are?"

Draw the following chart on the chalkboard to record students' guesses.

TOM'S GUESS	ANN'S GUESS	JOSE'S GUESS
1¢		
5¢		
10¢		
25¢		
50¢		
TOTAL		

Ask a student to come to the chalkboard and record his guess on the chart. Check that the student has listed six coins. Have the student add the total value of the coins he selected to see if it equals $.90. Repeat this procedure allowing many students to record their guesses on the chart. Discuss each student's guess. Say, "Why is it correct? Why is it not correct?" As soon as several correct solutions have been recorded on the chalkboard, e.g., two quarters and four dimes, three quarters and three nickels..., open your hand to show the six coins in your hand. Elicit that there may be more than one solution to a problem.

GETTING STARTED cont'd

"I am thinking of two numbers. I will give you some clues as to what these numbers are. Raise your hand when you know the numbers. Clue 1 is both numbers are less than ten."

Some students may make guesses at this point. Ask, "Can you be sure these are the two numbers of which I am thinking? Why not?" Elicit that there are many numbers less than ten and more information is needed.

Say, "Clue 2 is both numbers are even."

Discuss why we can make many guesses but still cannot be sure of the two numbers. Elicit that there are still many pairs of numbers that fit the clues given.

Say, "Clue 3 is the sum of the two numbers is 14."

Ask a student to state what the two numbers are and check to see that his guess meets all three conditions.

Ask the students to make up some similar problems of their own.

4.13.01

4.13.01.01 **check guesses against problem conditions in addition problems**

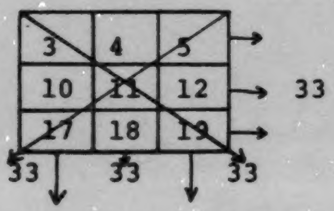
STRATEGY 1: Draw the following magic square on the chalkboard.
e.g.,

2	9	4
7	5	3
6	1	8

Explain that this is called a magic square because the sum of the numbers in each row, column and diagonal, is the same. Ask, "What is the sum of the numbers in the top row? The 2nd row?" Repeat this procedure using each row, column and diagonal. Say, "This square is magic in 8 ways."

Give each student an old calendar page and scissors. The students cut out any 3 by 3 square section from the calendar page. Check to see that every individual square has a number in it. Ask the students to look at their square and guess how many ways the square is magic. Ask, "How can you check to see how many ways your square is magic?" Elicit that it is necessary to find the sum of each row, column and diagonal. Allow each student to guess and check.

Ask a student to come to the chalkboard, draw their square, and see how many ways it is magic.
e.g.,



STRATEGY 1: cont'd

Repeat this procedure by having several students draw their calendar square on the chalkboard and show how many ways it is magic. Ask, "In what way are all calendar squares magic?" Elicit that the sum of the center row, center column and diagonal are always the same. Have students cut out other 3 x 3 calendar squares to check that this is always true.

STRATEGY 2:

Provide each student with a set of play coins. Say, "I bought $.53 worth of candy at the store and paid with a dollar bill. The clerk gave me my $.47 change with 5 coins. What were they?" Have a student make a guess. Record his guess on the chalkboard and ask him to check it by adding the coins. Repeat this procedure by having several students guess what the five coins were. When the correct combination of coins has been determined, e.g., one quarter, two dimes and two pennies, have students make up some similar problems to present to the class.

4.13.01.02 **check guesses against problem conditions in place value problems**

STRATEGY 1:

Prepare large oaktag cards with a numeral from 0 to 9 on each card. You should have at least 2 such cards for each numeral. Ask a student to display a 3 digit number using the cards. Next, ask another student to display an odd 3- digit number, e.g., 137. Then ask, "Can anyone make an odd 3-digit number that reads the same forward and backward?" e.g., 171, 363... Ask several students to display a number that meets these conditions.

STRATEGY 1:
cont'd

"Who can guess the number I am thinking of? It has three digits, it is odd, it reads the same forward and backward and the sum of it's digits is 5.

Ask a student to display his solution to this problem. Check with the class to see that the solution meets each of the conditions. Repeat this procedure using the following problem written on the chalkboard:

What is My Number?
It is a three digit number
It is an even number
The digits are all consecutive
The sum of the digits is 9
Who can guess my number? 432 or 234.

STRATEGY 2:

Prepare a set of envelopes. On each envelope write a guess-and-check place value problem.

e.g.,

It is a three digit number
The number is odd
The number has a zero in it
The sum of the digits is 17
What number is inside the envelope?

Inside each envelope place a piece of paper with the correct answer to the problem. Have each student make a set of cards with a numeral 0 through 9 written on each card.

Have students work in pairs. Give each pair two envelopes. One student reads the problem while the other student attempts to guess the number in the envelope using his set of numeral cards. The students check their guess to see that each condition has been met and then open the envelope. For the 2nd envelope the students change places. e.g., The student who reads the first problem will now solve the problem that his/her partner will read to him/her.

4.13.01

STRATEGY 2: cont'd

Provide time to have students read their problems and explain their solutions to the class.

4.13.01.03 **check guesses against problem conditions in multiplication problems**

STRATEGY 1: Reinforce that a magic square is a square in which the sum of each row and column are the same.

e.g.,

6	1	8	=15
7	5	3	=15
2	9	4	=15
15	15	15	

Say, "What is a multiplication magic square?" Elicit that it would be a square in which the products of each row and column are the same. Ask the class to use the digits 1, 1, 2, 2, 2, 3, 3, 4, 6 to make a square so that the product of every row and every column is 12.

e.g.,

2	6	1	=12
3	1	4	=12
2	2	3	=12
12	12	12	

Ask a student come to the chalkboard and fill in the 9 digits.

e.g.,

STRATEGY 1: cont'd

Check with the class to see if the product of each row and column is 12; e.g., 3x2x2 =12.

Have students work independently to make a magic multiplication square by arranging the digits 1, 1, 2, 2, 2, 4, 4, 4, 8 so that the product of each row and column is 16.

e.g.,

4	2	2	=16
4	1	4	=16
1	8	2	=16
16	16	16	

STRATEGY 2:

Prepare a set of large oaktag cards with a numeral from 0 through 9 on each card. Tape the cards with 3, 5 and 7 on them to the chalkboard face down. Say, "There is a different number on each of these cards. You will be able to guess what they are by listening to some clues."

Say, "Each number is less than 10." Have a student come to the chalkboard and write all numbers that are less than 10.

e.g., 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

Next say, "The numbers are all odd." Ask a student to come to the chalkboard and circle all the numbers that meet this condition.

e.g., 0, ①, 2, ③, 4, ⑤, 6, ⑦, 8, ⑨.

Then say, "The sum of the three numbers is the same as the product of two of the numbers." Ask a student to choose a set of three odd numbers and check to see if he can meet these conditions. Repeat this procedure until a student selects the correct number which meets the conditions.

P.O. 4.13.01.01

NAME: ______________________ CLASS; ________ DATE: ________

Fill in the number that is needed to complete each magic square.

(1.)+

6	1	8
7	5	3
2	9	4

(2.)+

7	12	5
6		10
11	4	9

(3.)+

9	2	7
4		8
5	10	3

(4.)+

3	8	
2	4	6
7	0	5

(5.)+

8	7	12
13	9	
6	11	10

(6.)+

11	12	7
6	10	14
	8	[illegible]

Solve:

7. Jenny has 3 different coins in her hand. The total value of the coins is $.40. What are the coins?

8. The sum of two consecutive odd numbers is 16. What are the two numbers.

9. Mary has five coins that total $.57. What are the coins?

10. The sum of 3 consecutive numbers is 18. What are the numbers?

P.O. 4.13.01.02

NAME: ______________________ CLASS; _______ DATE: _______

WHAT NUMBER AM I?

1. I am a three digit number.
I am an even number.
All three digits are the same.
The sum of my digits is 12

What number am I? ____________

2. I am a two digit number.
My digits are consecutive.
I am an odd number.
The sum of my digits is 5.

What number am I? __________

3. My number is odd.
I am a three digit number.
I read the same, forward and backwards.
The sum of my digits is 2.

What number am I? ___________

4. I am a two digit number.
Both my digits are consecutive. The sum of my two digits is 11.
I am an even number.

What number am I? __________

5. I am a three digit number.
All three digits are consecutive.
The sum of my digits is 9.

What number am I? ___________

6. I am a three digit number.
I am even.
I read the same forward and backwards.
The sum of my digits is 5.

What number am I? ___________

7. I am a two digit number.
The sum of my digit is 17.
I am an even number.

What number am I? __________

8. I am a four digit number.
All four digits are consecutive. I am an even number
The sum of my digits is 10.

What number am I? __________

18

P.O. 4.13.01.03

NAME:______________________________ CLASS:__________ DATE:________

Fill in the number needed to complete each multiplication magic square.

1.

2	3	3
3	6	1
3	1	6

2.

12	2	1
1	3	
2	4	3

3.

3	4	
2	1	6
2	3	2

4.

4	12	2
6	2	8
4	4	

Solve.

5. The sum of the digits of a two digit number is 9. The product of the two digit is 20. The number is odd. What is the number? ________________.

6. The digits of a three digit number are consecutive. The sum of the three digits are the same as their product. What is the number?____________.

7. The sum of the digit of a two digit number is 7. The numbers are consecutive and their product is 12. What is the number?_______________.

8. The digits of a three digit number are consecutive even numbers. The sum of two of the digits is equal to two times the other digit. What is the number?____________.

Unit 3

4.09.01 SPACE FIGURES AND THEIR PROPERTIES

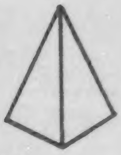
(2 lessons)

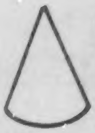
PERFORMANCE OBJECTIVES9

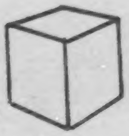
The student will be able to...

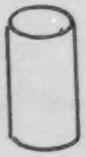
4.09.01.01A recognize various space figures; e.g.,

rectangular prism

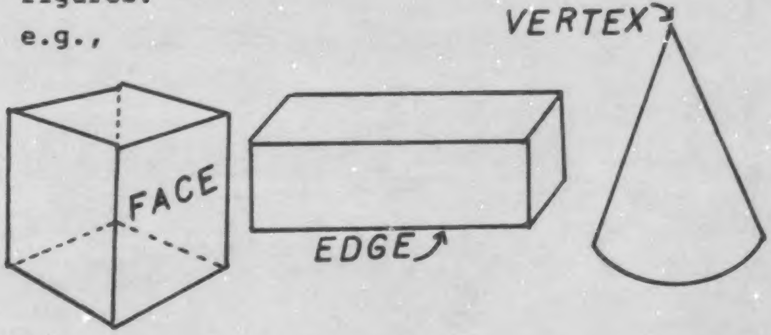

pyramid


cone


cube


cylinder

4.09.01.02A identify faces, edges, vertices of space figures. e.g.,



4.09.01

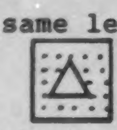
VOCABULARY

TERMS

rectangular solid
pyramid
cone
cube
cylinder
solid
space figure
face
vertex
edge
plane

GETTING STARTED

Distribute geoboards and rubber bands to groups of students. Say, "Let's take a walk around the park." Together, construct rectangles on geoboards. Use rubber bands to connect points. Ask, "What is the name of this figure?" Elicit that it is a rectangle. Write the word rectangle on an oak tag chart. Say, "Let's build a 3-sided fence." Show triangles on geoboards.

Ask the students to name this figure. Elicit that it is a triangle and write triangle on the same chart. Say, "Let's make a border of flowers measuring the same length all around." Together, construct squares on geoboards.  Write the word square on the same chart after students have named it. With the square still on the geoboard, say, "Let's build a box. Why are we having a problem?" Elicit that we cannot build a box because the geoboard is flat. Say, "All the figures we have constructed were flat. We use the term plane to describe figures on a flat surface. Write the word plane on the top of the geometry chart where we listed rectangle, triangle, square." Ask individual students to illustrate these figures on a chart next to the term. Say, "When a figure is not a plane figure, it does not lie flat. We name this a space figure. A box is a space figure." Write the words space figure on the chalkboard and on a new chart.

Say, "Susan is filling a basket with eggs." Show an oak tag rectangle and place it on the desk. Place some felt or plastic

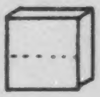
GETTING STARTED cont'd

circles on the rectangle. Ask a student to come up to "lift" the "basket." Ask the students, "What do you think might happen?" Elicit that the eggs will fall off. Reinforce that the rectangle is flat or a plane figure. Write term plane figure on the chalkboard. Show, with the rectangle, that a plane figure has two dimensions, length and width. Ask, "How can I build a basket so that the eggs stay inside?" Elicit that sides are needed.

Show the students any size box available in the classroom. Ask a student to point to the inside of the box. Show various heights of the box.

e.g.,

1.

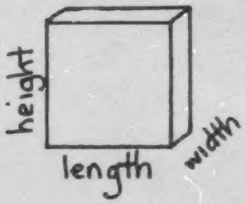


2.

3.

Ask, "What is the word we use to show how "far up" something is inside the box? Think of how far up the water comes to your waist at the beach." Elicit that we use the word "deep" or "depth".

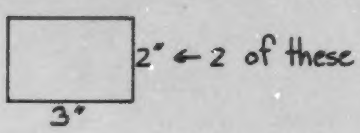
Say, "When an object has depth, it can be filled. We say it is a space figure." Write the word space on the chalkboard. Show, with the box, that a space figure has three dimensions: length, width, and height. Show these on a chart.



4.09.01

4.09.01.01 **recognize various space figures**

STRATEGY 1: Distribute geoboards and rubber bands to groups of students. Say, "Let's build a model refrigerator for a dollhouse. Let's construct a rectangle on the geoboard for the base." Help students construct rectangles. Ask, "What do you think is the next step?" Elicit that we must now build upward or "high". Say, "How can we do this on the geoboard?" Elicit that we can't as the geoboard is flat. Say, "Let's build a refrigerator so that it has height." Write the word "height" on the chalkboard. Use 6 rectangles of oaktag this way.



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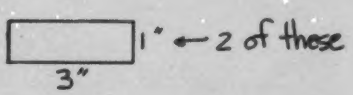

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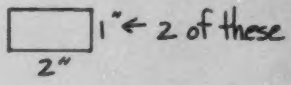
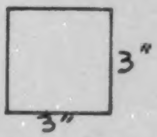


← 2 of these

Use 1" X 2" rectangle for base. Ask individual students to complete the "refrigerator" by building up the sides with two 3" X 2" rectangles and two 3" X 1" rectangles. Place other 2" X 3" rectangle on top; hold together with scotch tape. Say, "When a figure has 6 rectangular sides, we name it a 'rectangular prism'." Label the "refrigerator" rectangular prism and display in the room.

Say, "We would like to make a holiday, or birthday decoration." Show students a construction paper square with 3" sides.



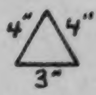
Say, "Let's fill our decoration with candy." Elicit that we cannot fill this, since it is a plane figure. Reinforce that plane figures have two dimensions, length and width. Space figures

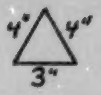
STRATEGY 1:
cont'd

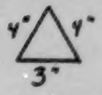
have a third dimension. The third dimension is height.

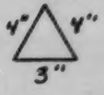
Show 4 construction paper triangles having two 4" sides and one 3" side.

e.g.,



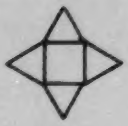






Ask students to come up to help make the decoration. Attach the 3" side of each triangle to a side of the square.

e.g.,



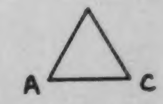
Fold up the sides of the square to a point. Keep sides of triangles together with tape. Say, "We name this space figure a 'pyramid'." Label the pyramid and display it.

Say, "Let's construct a clown hat for our puppet show." Show a triangle made with construction paper.

e.g.,

Join points A and C. Hold together with your finger or tape.

e.g.,



Ask, "What do you notice about this figure?" Elicit responses such as, "It is narrow at the top, wide at the bottom, it forms a closed tip at the top, the bottom looks like a square." Ask, "How

STRATEGY 1: cont'd

many sides does it have?" Elicit that there are no sides. Say, "We name this space figure a 'cone'." Label the cone and display it.

Say, "We would like to make a pair of dice for a game." Use 6 squares, each with 2 inch sides. Ask students to come up to form the 6 sides into a space figure.
e.g.,

Say, "We name a space figure with 6 squares as its sides a 'cube'." Label the cube and display it.

"I would like to make a container that will hold juice." Show a 4" X 5" sheet of paper. "How shall I begin?" Elicit that we can roll the paper until 2 sides meet. "What has happened to the sides?" Elicit that there are none. "How can I fill this with juice?" Elicit that we need a bottom. "How can I keep the juice from spilling?" Elicit that we need a top. Attach 2 round circles, one to the top and one to the bottom of the rolled paper. "We name this space figure a 'cylinder'." Label the cylinder and display it.

STRATEGY 2: Say, "We would like to find a fish tank to hold our fish and the water." Show an oaktag rectangle. "What might be a problem with this?" Elicit that the fish and water won't stay in. Show an open rectangular box. "What might cause a problem?" Elicit that the fish will jump out. "What should we do?" Elicit that we need a top. "How many sides will that make?" (6.) Say, "When a space figure has 6 retangular sides, we call it a

STRATEGY 2:
cont'd

'rectangular prism'." Label the box "rectangular prism" and display it.

Say, "Carlos is going camping." Ask, "Where do you think he might sleep?" Elicit that he might sleep in a tent. Ask, "How is a tent shaped?" Elicit such terms as "triangle, sloped, slanted." Ask a student to illustrate this on the chalkboard. Show a commercial model of a pyramid. Ask, "How is this different?" Elicit that the model is a space figure. Ask, "How many sides does it have?" Elicit that there are 4 sides and a base. Ask, "How are the sides shaped?" Elicit that they are triangles. Say, "We name a space figure with triangular sides a 'pyramid'." Label the model pyramid and display it.

Show the students a model of a rectangular space. Say, "I would like to fill this with a scoop of ice cream." Ask, "What might be a problem?" Elicit that the ice cream won't fit. It will fall inside. Show a paper triangle. Ask, "What might be a problem?" Elicit that the ice cream will melt off the top. Fold the sides of the triangle to form a cone.

e.g.,

1)

2)

Ask a student to describe the new figure. Elicit that it is wide at the top and has a point at the bottom. Say, "We name this figure a 'cone'." Label the figure "cone" and display it.

Distribute colored cubes. Ask, "How are they alike?" Elicit that they all have six sides. Ask, "How are they different?" Elicit that they are different in color. Ask, "Are they different in any other way? No." Say, "We call this a cube." Label it and display it.

4.09.01

STRATEGY 2: cont'd Show a model of a rectangular prism. Say, "I can fill this with cookies, candy, ..." Ask, "Suppose I had juice. What would I use to place it in?" Ask a student to illustrate on the chalkboard. Show a model of a cylinder. Ask, "How is it different from the illustration?" Elicit that it is space figure. Say, "We name this a 'cylinder'." Label and display.

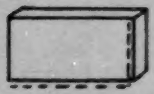
4.09.01.02 **identify faces, edges and vertices of space figures**

STRATEGY 1: Ask a student to come face the chalkboard. Ask the other students, "How can we get him to look at the class?" Elicit that he will have to turn around and show his face to us. Ask, "How can we tell who the person is?" Elicit that we look at the person's face. Say, "The face of a person or something is the part that we can see. It is the front or the outside surface." Show a wristwatch. Ask a student to identify the face or outside surface. Show students a model of a cube. Ask, "What parts of the cube do we see?" Say, "We name these the faces of the cube." Write term 'face' on chalkboard. Repeat this procedure for rectangular prism and pyramid.

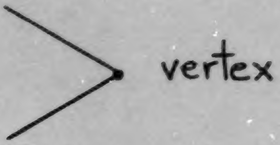
Ask a student to roll his pencil so that it falls from the desk. Ask, "What happened? From where did it fall?" Elicit that it fell off the edge. Ask students to point to the edge of their desks. Show a model of a rectangular prism. Ask, "How many edges can you find in this figure?" Show a rectangular prism. Say, "A little ant was crawling along the edge of a flower box. Another ant was

STRATEGY 1: cont'd

coming from the other side.
e.g.,

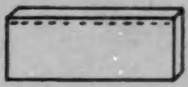


Ask, "Where will they meet?" Ask a student to show the point at which they meet. Say, "We name this point the vertex. Write term on a geometry chart and illustrate vertex.
e.g.,



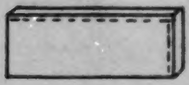
STRATEGY 2: Distribute colored rods. Ask students to look inside the rods. Ask, "Why are you having a problem?" Elicit that we can't see inside. Say, "The part that we can see, the outside surface, is called the face." Ask students to find all the faces of a rod. Place term "face" on a geometry chart. Illustrate.

Say, "Imagine that the orange rod is a doll's bed and that the doll is sitting on top." Ask, "What is the part of the bed between the top and the sides?"



Elicit the term "edge". Ask students to come up to show the edges of several rods.

Ask students to run their finger along the edge of the blue rod. Ask them to run another finger along the side edge.



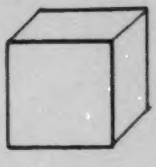
STRATEGY 2: cont'd

Ask, "What happened?" Elicit that both edges meet. Ask, "What is the term for lines that meet?" Elicit the term intersect. Say, "The point at which both edges, or lines, intersect is called the vertex. Write term "vertex" and illustrate on a geometry chart.

P.O. 4.09.01.01

NAME: ______________________________ CLASS: ________ DATE: ________

1. Circle the rectangular solid.



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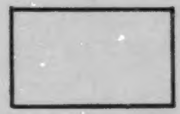

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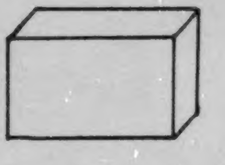
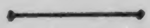


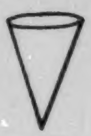
c.



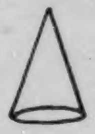
d.

2. A cube is made up of ________ squares.

3. Circle the cylinder.



a.



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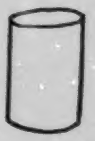

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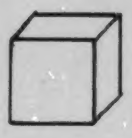
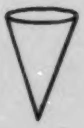


d.

4. Circle the cones.



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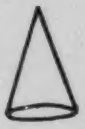

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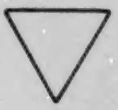
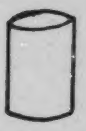


c.



d.

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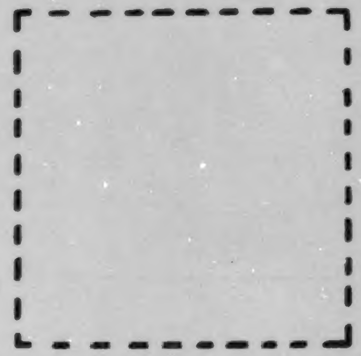
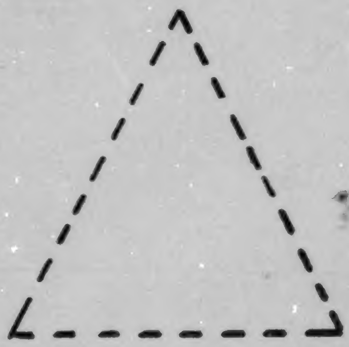
P.O. 4.09.01.01

NAME: ______________________________ **CLASS:** __________ **DATE:** ________

5. Cut out and trace 1

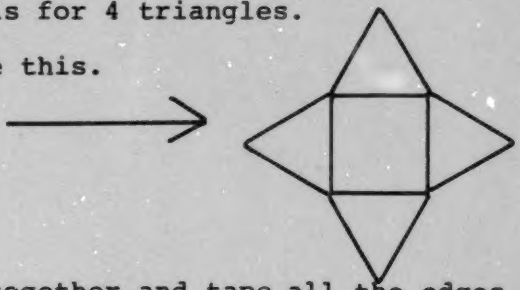


Cut out and trace 4



Attach the shorter (2 inch) side of a triangle to a side of the square. Do this for 4 triangles.

Your shape should look like this.



Bring points of triangles together and tape all the edges.

6. Name the figure you have just constructed.

7. Name the correct figure.

   a) A box is shaped like a ______.

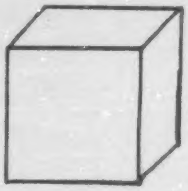
   b) A can is shaped like a ______.

   c) A tent is shaped like a ________ .

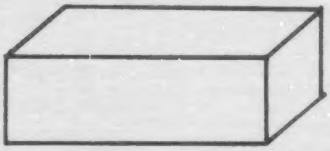
P.O. 4.09.01.02

NAME: ______________________ CLASS; ________ DATE: ________

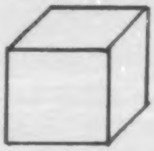
1. Use a crayon to color 1 face of this cube.



2. Use a crayon to show 3 edges of this rectangular solid.



3. Circle 4 vertices of this figure.



4. Draw a cone. Place a colored dot at the vertex.

5. True or False:

   a) There is one face on a cube. ____________

   b) A cone has 5 edges. ____________

   c) A cylinder has no edges. ____________

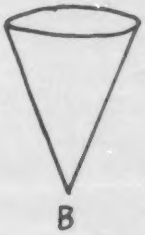
   d) A cylinder has no vertices. ____________

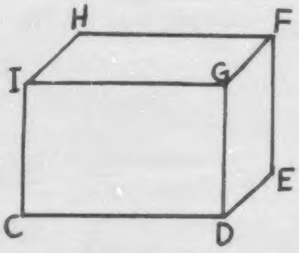
Continued on the next page.

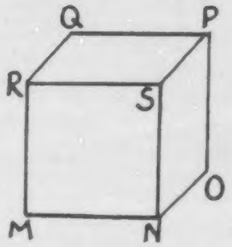
P.O. 4.09.01.02

NAME: ____________________ CLASS; ________ DATE: ________

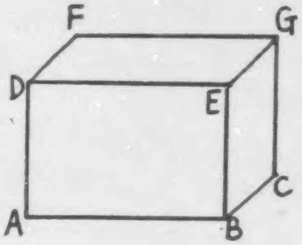
6. Name all the vertices that you see:

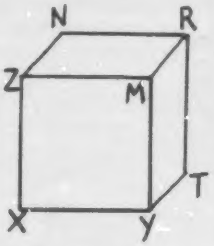


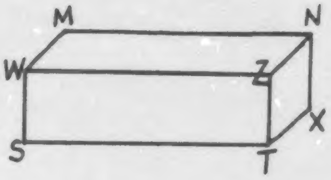




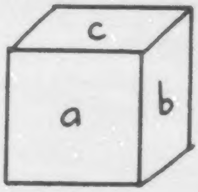
7. Name all the edges that you see:

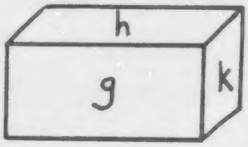


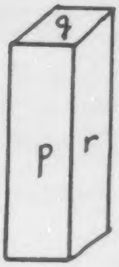




8. Name all the faces that you see:







4.12.01 GRAPHS

(2-3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

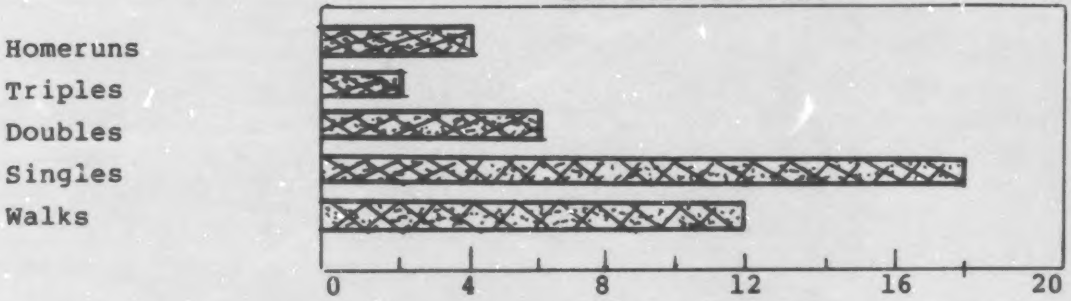
4.12.01.01A make frequency tables from tallied data; e.g.,

The frequency with which given letters occur in a poem, a story, or on a page.

Letter	Tally	Frequency
A	////	4
B	//	2
C	~~////~~	5

*4.12.01.02A graph data drawn from newspaper; e.g.,

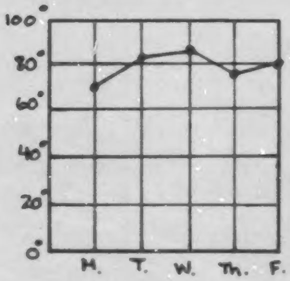
Baseball Record of Hits and Walks for Joan Perkins



4.12.01.03A read and interpret information from a line graph;

e.g.,

MONDAY	70°
TUESDAY	81°
WEDNESDAY	84°
THURSDAY	76°
FRIDAY	80°

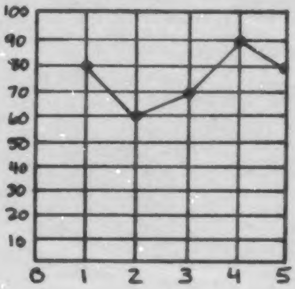


4.12.01.04B construct a line graph from a table of data.

e.g.,

Use test scores to show intervals to one hundred.

TEST	SCORES
1	80
2	60
3	70
4	90
5	80



4.12.01

VOCABULARY

TERMS	SYMBOLS
tally	~~////~~ //
data	
line graph	
frequent	
information	
graph	
chart	

GETTING STARTED

Say, "We are going to make a survey of television programs that we like to watch." Ask five students to list a different TV program on the chalkboard. "How many students like to watch the first program that we listed?" Ask a student to count the number of hands that are raised and list that number next to the first TV program shown on the chalkboard. Repeat this procedure for the remaining TV programs. Say, "We can make a drawing to show the listed information. The drawing is called a chart or a graph."

Distribute to groups of students three different unifix cubes. Say, "We have the results of a survey of favorite colors chosen by students in an art class. The results are: eight red cubes, five blue, and three yellow." Stack your cubes to show this. Ask, "What color did most of the students choose?" Elicit that most chose red. "What color did the least number of students choose?" Elicit that the color least chosen was yellow. "How many more students chose blue than yellow?" Elicit that two more students chose blue. "How many students took part in the survey?" (16.) "We can make a chart of this survey. We name the chart a graph. The information that we have is called data."

Show the following chart on chalkboard.

e.g.,

Color	Choices of Students (Data)
red	~~////~~ ///
blue	~~////~~
yellow	///

4.12.01

4.12.01.01 Make frequency tables from tallied data

STRATEGY 1: Show an oaktag chart on the chalkboard. Say, "We would like to write a story about our trip to the zoo." Ask students to help construct the story. Write on chart, "On May 14 our class went to the Bronx Zoo. We got on the bus at 9:30 AM. On the bus we told stories and sang songs. At the zoo, we saw some bears, monkeys and tigers. The zookeeper showed us how he feeds the animals. We went home at 2 PM."

Say, "Let's play a game with the story. "How many times do you see the letter 'e' in the story?" Elicit the response, we see the letter "e" 22 times. "Number 22 tells us how frequently we see the letter 'e' in the story." Write the word "frequency" on the chalkboard. "Was it easy to count the number of e's in our head?" Elicit that we could lose count very easily. "We can make a slash each time we see an 'e'; this way we will not lose count. Let's construct a chart to help us count." Ask students to take a sheet of paper and fold it into 3 columns. Say, "The slash/vertical line is called a tally. The number of times that we see the 'e' is called the frequency. Let's label our chart."

e.g.,

Letter	Tally	Frequency

4.12.01

STRATEGY 1: cont'd

Say, "Each time we count five in a group, we show 4 tally marks, then draw a diagonal line across the 4 tallies. Show on chalkboard: ////.

e.g.,

Letter	Tally	Frequency
e	~~////~~ ~~////~~ ~~////~~ ~~////~~ //	22

Repeat this procedure for the letters "a", "o".

STRATEGY 2:

Distribute 15 straws or sticks. Ask a student to read the following: "During the softball game, Carl had 4 hits, Sam had 6 hits and Maria had 12 hits." Say, "Show us, with the straws, the number of hits that Carl had." Write //// on chalkboard to represent straws. Say, "We call these tallies. When we are counting, we can use a tally for each item that we count."

Ask, "How many hits did Sam have?" Elicit that he had 6. Say, "Show us with the straws the number of hits Sam had." Say, "When we group five objects, we show 4 tallies, then place the fifth diagonally across the other four." Ask students to now show 6 straws. Say, "Let's make a chart to show the number of hits received in the game. Fold your paper into 3 columns and label each column:

e.g.,

Name	Tally	Frequency
Carl	////	4
Sam	~~////~~ /	6
Maria		

Repeat this procedure for 12 hits.

4.12.01

4.12.01.02 Graph data drawn from newspaper

STRATEGY 1: Distribute a set of red, green and yellow interlocking cubes,a sheet of rexographed paper with 1-inch squares, and crayons. Say, "At the ice cream stand, 4 students chose cherry ice cream." Ask the students to show 4 red cubes:
Say, "6 students chose vanilla ice cream." Ask students to show 6 yellow under the red.

e.g., ☐☐☐☐ red
☐☐☐☐☐☐ yellow

Say, "2 students chose mint ice cream." Ask students to show 2 green cubes under the yellow.

e.g., ☐☐☐☐ red
☐☐☐☐☐☐ yellow
☐☐ green

Say, "Let's make a chart to show the students' ice cream choices." On squared paper, ask students to label:

Flavors				
cherry				
vanilla				
mint				

Ask students to place a zero at the bottom of the paper and to number from 1 through 8. Show on chalkboard:

Flavors								
cherry								
vanilla								
mint								

STRATEGY 1: cont'd

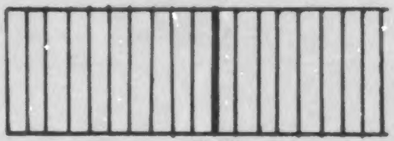
Say, "We want to color enough boxes to show the cherry ice cream. How many boxes should we color?" Elicit that we will color 4 boxes in red. Ask students to color.

Flavors								
cherry	■	■	■	■				
vanilla								
mint								
0	1	2	3	4	5	6	7	8

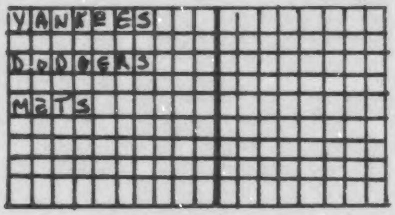
Repeat this procedure for 6 vanilla ice creams, 2 mint.

Say, "We have just constructed a bar graph, which is a drawing to help us obtain information. Write term "bar graph" on chalkboard.

Show students the sports page of a newspaper. Say, "The Yankees won 18 games, the Dodgers won 15 and the Mets won 10 games. Let's make a chart to show this information." Distribute one sheet of graph paper and a crayon to each student. Ask students to count 10 spaces from the left and to fold.



Say, "Write 'Yankees' on the first line, skip a line, write 'Dodgers', skip a line, and write 'Mets'.

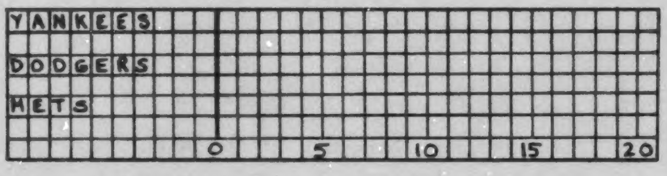


4.12.01

STRATEGY 1: cont'd

Say, "Place a zero directly under the fold, skip 5 spaces, write a 5, skip another 5 places, write a ten. Continue this until you reach 20."

e.g.,

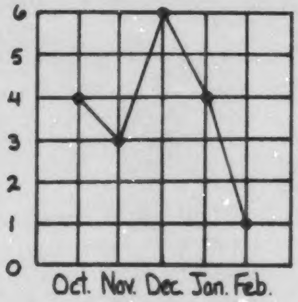


Say, "We are going to use our crayon to color in the amount of boxes for each team's winning games." Ask, "How many boxes should we color for the Yankees?" Elicit that we will color 18. Ask students to do this. Repeat this procedure for 15 games for the Dodgers and 10 games for the Mets.

Say, "We have constructed a bar graph, which is a chart that gives us information." Write the word "bar graph" on chalkboard.

4.12.01.03 **Read and interpret information from a line graph**

STRATEGY 1: Prepare a rexographed sheet showing volleyball games won by fourth graders and distribute to students.



Games Won in Volleyball

4.12.01

STRATEGY 1: cont'd

Say, "The row at the left tells when games were played." Ask students to find the line that shows "November". Say, "Place your finger at the point on that line and find the number directly below it. What is that number?" (3). Say, "The bottom row tells how many games were won. The fourth grade won 3 games in November." Repeat this procedure for the other 4 months.

Ask, "When were the most games won?" December. Ask, "How many games were won?" (6.) Ask, "What happened to our team from December to January?" Elicit that we began losing games. Ask, "How do you know?" Elicit that we won 4 games in January, one game in February. Ask, "When did we have the greatest increase in winning games?" Elicit the response, from November to December. Ask, "How do we know?" Elicit, we won 3 games in November and 6 in December.

STRATEGY 2:

Distribute bead frames. Say, "Pamela is making a necklace with 4 strands. The first strand will have 7 beads." Ask students to show 7 beads: . . . . Say, "The 2nd strand will have 3 beads." Ask students to show:

```
. . . . . . .
. . .
```

Say, "The next strand will have 8 beads." Together, show:

```
. . . . . . .
. . .
. . . . . . . .
```

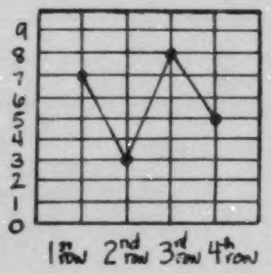
Say, "The last strand will have 5 beads." Together, show:

```
. . . . . . .
. . .
. . . . . . . .
. . . . .
```

Ask, "What can you tell us about the order in which the beads are arranged?" Elicit that we started with 7, then less than 7, then more than 7, and

STRATEGY 2:
cont'd

then less than 7. Ask, "Which row had the most?" 3rd. Say, "We can obtain the same information by reading from a graph. Show an oaktag graph taped to chalkboard.



Say, "The left hand column tells the number of the beads. The bottom row tells number of the strand." Say, "Take your finger and run it along the first row until you reach the point. Now, run your finger down to the numbers." Ask, "What number is this?" 7. Say, "There are 7 beads in the first row." Repeat this procedure for 2nd, 3rd and 4th row. Ask, "Can you tell us about the order of the beads?" Elicit that we had less, then more, then less. Ask again, "Which row had the most?" 3rd. Ask, "Which row had the least?" 2nd. Ask, "How do you know?" Elicit the response that the 2nd has only 2 beads. Ask, "When did the number of beads increase?" Elicit, from the 2nd to the 3rd rows.

4.12.01.04 **construct a line graph from a table of data**

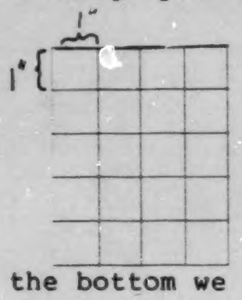
STRATEGY 1: Say, "Stanley is keeping a record of books that he reads. He made a chart that looks like this:"

October - 4 books
November - 6 books
December - 3 books
January - 8 books

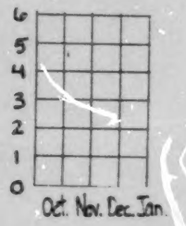
4.12.01

STRATEGY 1:
cont'd

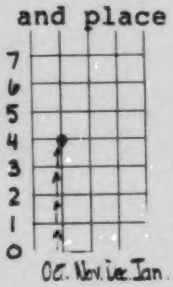
Say, "Let's enter this data on a line graph." Write terms "data" and "line graph" on chalkboard. Distribute rexographed paper showing one inch squares.



Say, "On the bottom we are going to list the months and the number of books read at the left of the graph. Start with zero and count by ones from there."

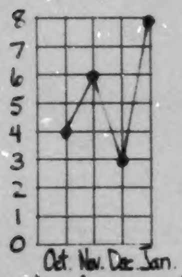


Ask, "How will a person reading this graph know what the numbers stand for?" Elicit that we must give a title, e.g., Number of Books Read. Write title on chalkboard for students to enter on graph. Ask, "How many books did Stanley read in October?" Elicit that he read four. Say, "Place your finger on the line that says October and move up. Keep looking at the numbers to the left until you see the 4. Stop, and place a point at that spot."



Repeat this procedure for November, December and January. Say, "Connect the points between October and November by constructing a line segment." Repeat this procedure for December and January.

STRATEGY 1:
cont'd

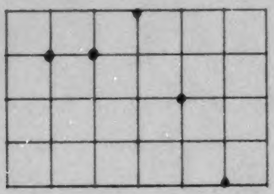


STRATEGY 2: Distribute one inch graph paper and chips. Say, "Jenny was keeping a record of her test scores." Show on chalkboard:

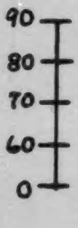
Test	score
1	80
2	80
3	90
4	70
5	60

Let's place this data on a line graph. Write terms "data" and "line graph" on chalkboard.

Say, "The first row of chips will mean that she received 60%, the 2nd row 70%, the 3rd row 80%, the fourth row 90%. Place a chip on the 3rd row, the 2nd chip on the third row, the 3rd chip on the 4th row, the 4th chip on the 2nd row, the 5th chip on the 1st row."

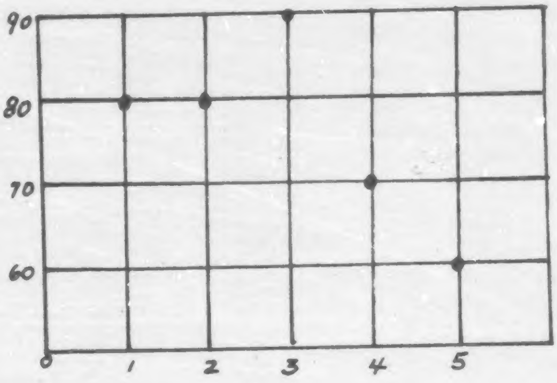


Say, "We can place points where the chips are." Ask students to mark a point where each chip is. Ask, "Why will someone have a problem reading this graph?" Elicit that there is no title. Ask the students to list the scores on the left hand side, beginning with zero.

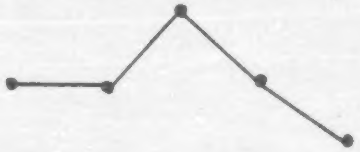


STRATEGY 2: cont'd

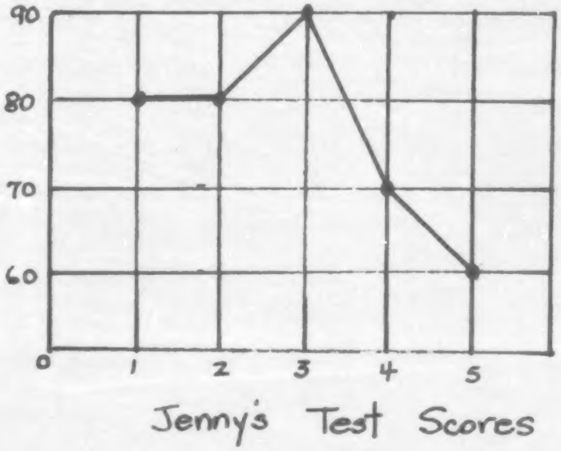
Ask students to number, from left to right, at the bottom, the numbers of the tests. Show students an oaktag graph:



Say, "Check your graph to see if it looks like this. Ask, "What will be a good method of showing how the grades went up and down?" Elicit that we can construct line segments to connect the points.



Ask, "How will a person reading this graph know what we are talking about?" Elicit that we need a title, "Jenny's Test Scores" on the bottom. Ask students to show this on their graph.



P.O. 4.12.01.01

NAME: ______________________ CLASS: ________ DATE: ________

(1) Indicate the frequency next to each tally.

Tally	Frequency	Tally	Frequency
111	___	~~1111~~ ~~1111~~	___
~~1111~~	___	~~1111~~ ~~1111~~ 111	___
~~1111~~ 11	___	~~1111~~ ~~1111~~ ~~1111~~	___

---

(2) Fill in the missing items for each table of data.

Times we played ball	Tally	Frequency
March	1111	
April	~~1111~~ 111	
May	~~1111~~ ~~1111~~	

Times it showed	Tally	Frequency
December		4
January		6
February	~~1111~~ ~~1111~~	

Absent	Tally	Frequency
Martha	111	
Ivan	~~1111~~ 111	
Lesley		6

TV Watching	Tally	Frequency
1st Week		6
2nd Week	1111	
3rd Week		7

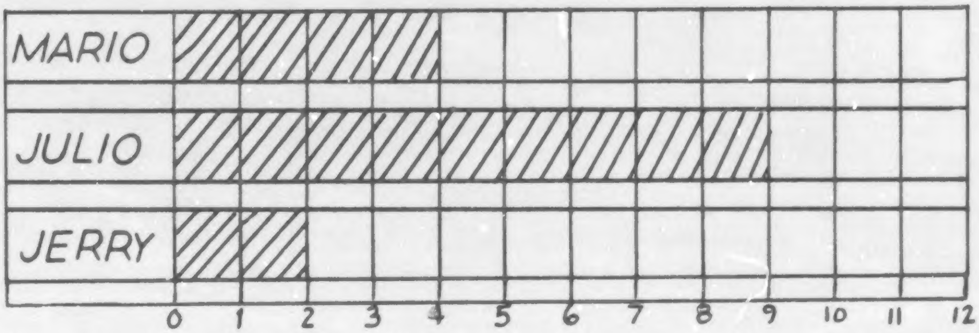
(3) It rained 3 days in October, 7 days in November, 11 days in December. Use this table to tally the days that it rained and the frequency.

Rainy Days	Tally	Frequency
October		
November		
December		

P.O. 4.12.01.02

NAME: ____________________ CLASS: ________ DATE: ______

(I) Use the graph to answer the questions.

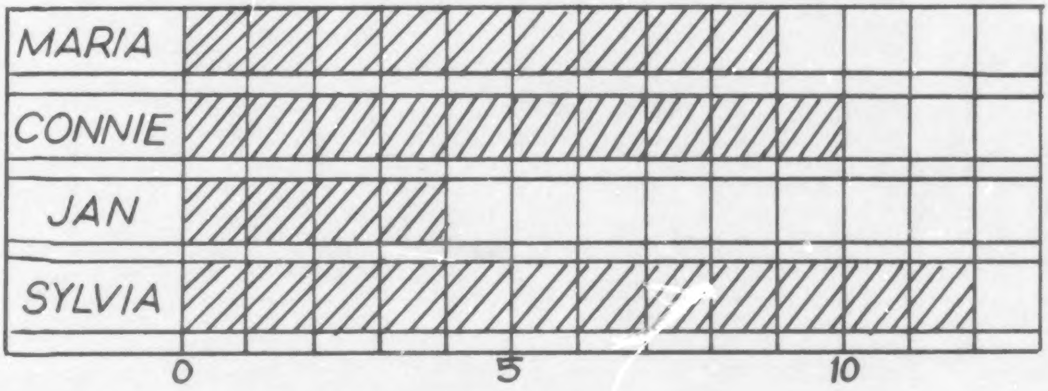


1. How many hits did Mario have? 4.

2. How many hits did Julio have? ____________

3. Jerry had ____ hits.

4. Who had the least number of hits? ____________



1. Who read the most books? ____________

2. How many books were read altogether? ____________

3. How many more books did Maria read than Jan? ____________

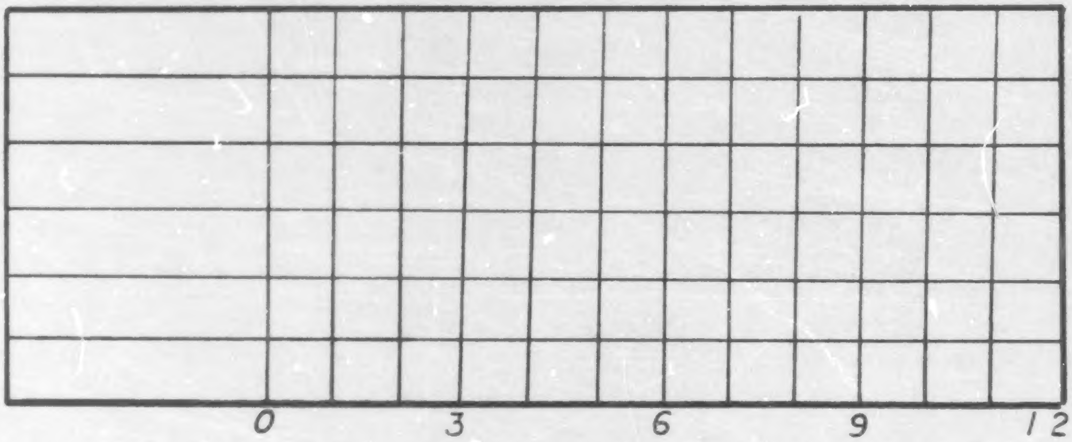
Continued on the next page.

P.O. 4.12.01.02

NAME:____________________ CLASS:________ DATE:_______

II Complete this graph using the information given.

COLOR NO OF STUDENTS CHOOSING EACH COLOR



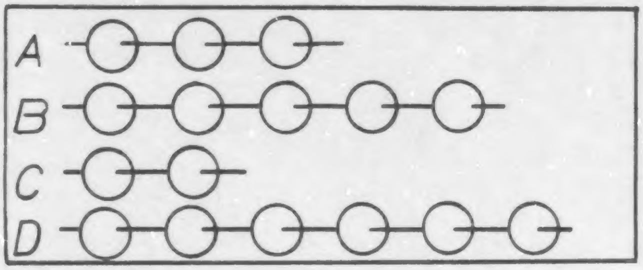
For the art project, 5 students chose red paper, 7 chose blue, 3 chose yellow, 8 chose green.
With your crayons, show the number of students who chose each color.

P.O. 4.12.01.03

NAME: ______________________________ CLASS: __________ DATE: __________

I. Use this chart to answer the questions.
II. Use the graph to answer the questions.

I



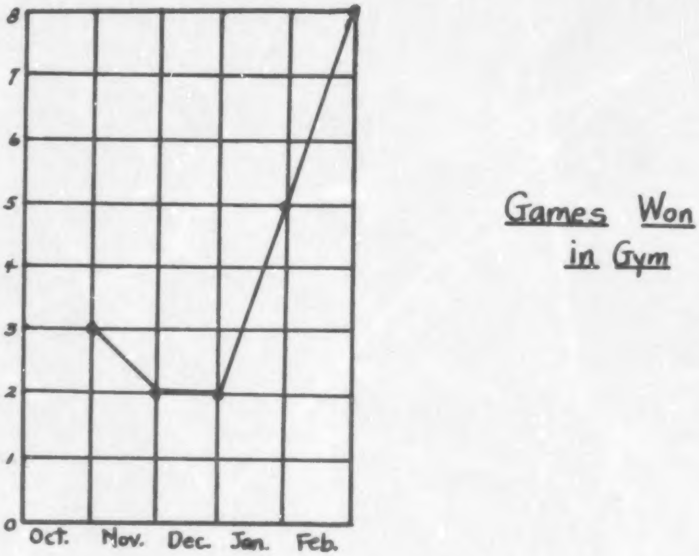
(a) Which row has the most beads? D

(b) Which row has the least? ______________

(c) How many more beads are in the second row than the first? ______

(d) How many beads were used altogether? ______________

II


Games Won in Gym

1.

(a) How many games were won in October? ____________________

(b) In what months did we win the same number of games? ____________

(c) In what month did we win the least amount of games? ____________

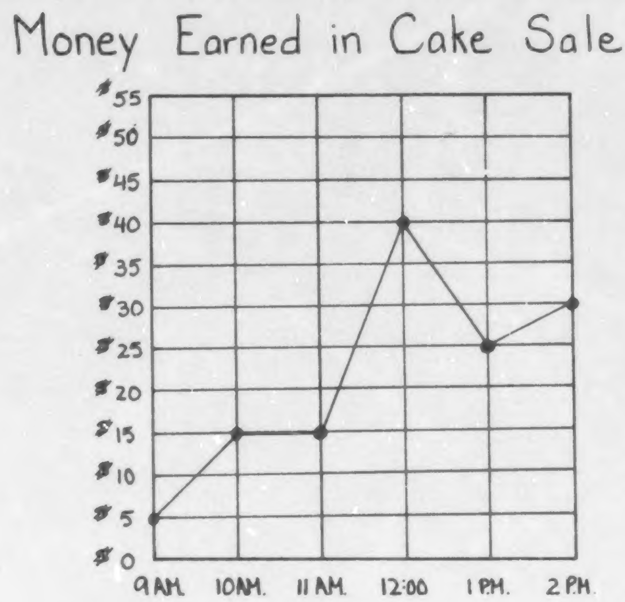
(d) When did we win the most games? ______________________

(e) How many games did we win in all? ____________________________

- 6d - continued on the next page

P.O. 4.12.01.03

NAME: ______________________ CLASS: __________ DATE: ________



2.

(a) When did we sell the least amount of cake? ______________

(b) When did we sell the most? ______________________

(c) At what times did we earn the same? ______________________

(d) Where was the greatest increase in sales? ______________

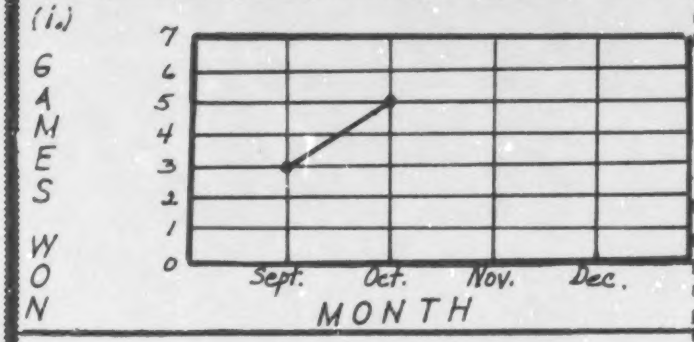
(e) At what time did sales decrease? __________________

P.O. 4.12.01.04

NAME:______________________________ CLASS:________ DATE:_______

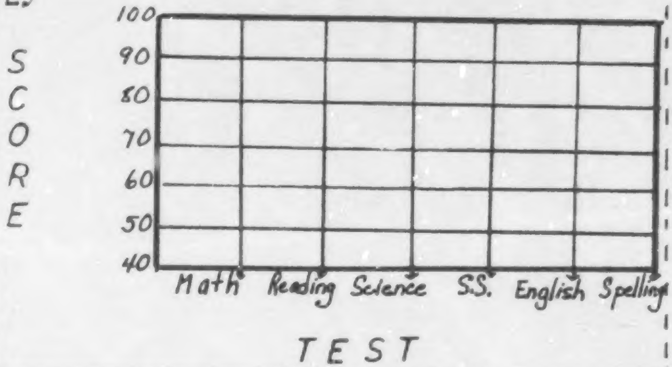
Construct a line graph for each table of data.

(1.)



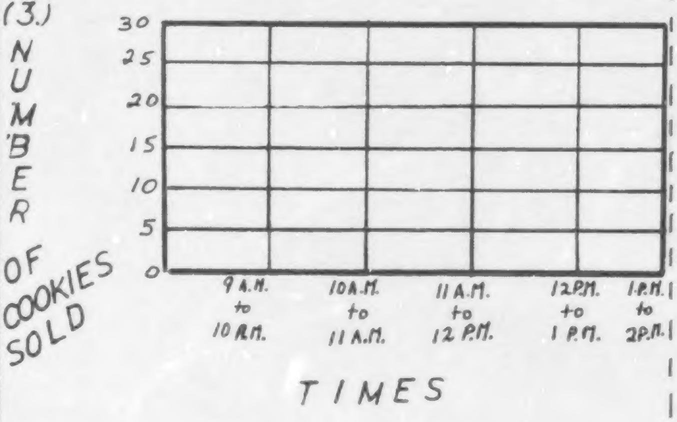
Month	Games Won
Sept.	3
Oct.	5
Nov.	2
Dec.	6

(2.)



Test	Score
Math	60
Reading	80
Science	90
Social Studies	70
English	100
Spelling	80

(3.)



Time	Number of Cookies Sold
9 A.M. - 10 A.M.	5
10 A.M. - 11 A.M.	15
11 A.M. - 12 A.M.	10
12 P.M. - 1 P.M.	20
1 P.M. - 2 P.M.	25

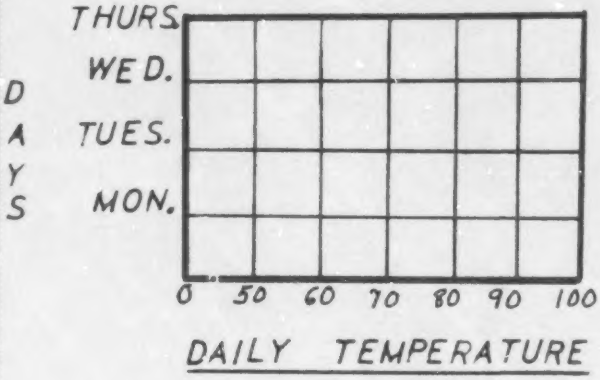
Continued on the next page.

P.O. 4.12.01.04

NAME:____CLASS:__________DATE:_______

Directions: Construct a line graph for each table of data.

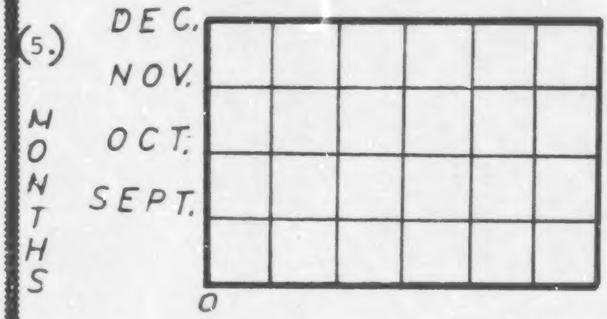
(4.)



DATA

Day	Temperature
Monday	80
Tuesday	65
Wednesday	75
Thursday	69

(5.)



DATA

Month	Books to be read
Sept.	
Oct.	
Nov.	
Dec.	

Books to be read

This set of data shows the number of books (1-6), you plan to read each month.

Enter that number, and show on line graph.

Complete the graph.

4.14.02 PLACE VALUE

(ongoing)

PERFORMANCE OBJECTIVES

The student will be able to...

4.14.02.01 associate the numerals 10, 100 and 1,000 with the words;

e.g.,

10	ten
100	hundred
1000	thousand

4.14.02.02 count by tens and hundreds through one thousand;

e.g.,

count orally by tens
10, 20, 30,... 1,000

count orally by hundreds
100, 200, 300... 1,000

4.14.02.03 identify and write numerals through thousands place.

e.g.,

0... 1,000

4.14.02

VOCABULARY

TERMS	SYMBOLS
ten thousand	10,000
one thousand	1,000

GETTING STARTED

Write a place value chart on the chalkboard.

Hundreds	Tens	Ones

Ask the students to place the following numbers on the chart.

14, 36, 154, 204

After the students have placed the numbers on the chart, ask them to write the number in words.

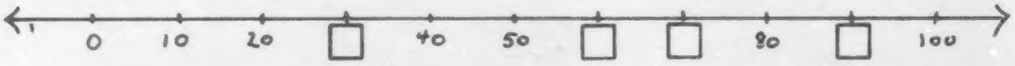
e.g.,

Hundreds	Tens	Ones
	1	4
	3	6

one ten + four ones
three tens + six ones

Repeat this procedure with other numbers through hundreds.

Draw a number line on the chalkboard.



Ask a student to fill in the missing multiples of ten.

Repeat this procedure with a number line counting by hundreds.

GETTING STARTED cont'd

Write the following on the chalkboard and ask the students to translate to the standard numeral.

thirty
seventy
forty-two
eighty-eight
one hundred ten
nine hundred six

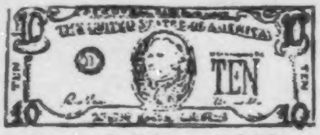
78

4.14.02

4.14.02.01 **Associate the numerals 10, 100 and 1000 with the words**

STRATEGY 1: Give students copies of a ten dollar bill, one dollar bill and a hundred dollar bill. Ask students to write the amount of each dollar bill under each picture.

e.g.,



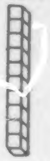
ten-dollar bill

Distribute pictures of a dime. Ask students to write in words how many cents there are in one dime, one dollar, ten dollars.

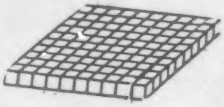
STRATEGY 2: Prepare objects such as money and square material. Ask students to identify these objects by writing them in words.

e.g., 10 strip of squared material

ten



hundred



4.14.02.02 **Count by tens and hundreds through one thousand**

STRATEGY 1: Write the following sequences on the chalkboard:

1) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
2) 10, 20, 30, __, __, __, __, __, __, __
3) 210, 220, 230, ___, ___, ___, ___, ___

Ask students if they see patterns within the 3 sequences. Ask a student to give you the next

STRATEGY 1: cont'd

number when counting by tens, by hundreds. Say, "My number is 440, what is the next number when counting by tens?" Repeat this procedure counting by hundreds.

STRATEGY 2:

Ask students to explain how they count while jumping rope. Elicit the response, we count by 10's. Place the sequence on the chalkboard. e.g.,
10, 20, 30, 40, 50, 60, 70 80, 90, 100
and then repeat the cycle to 200.

Ask students to count orally to 1,000 by tens. Ask students, "Do you recognize a pattern?" Ask students to apply the pattern and count by 100's to 1000.

4.14.02.03 **identify and write numerals through thousands place**

STRATEGY 1:

Draw a place value chart on the chalkboard through thousands.

e.g.,

thousands	hundreds	tens	ones

Reinforce the place value chart with the students.

Write digits in each column. Ask students to identify the number on the chart.

th	h	t	o
3	4	6	2

= 3,462

Ask students to write the numeral in words. Repeat the procedure using different numbers, such as

STRATEGY 1: cont'd

3064, 4602, 4002 and 9015. Ask students to read and write each numeral.

STRATEGY 2:

Write several numerals on the chalkboard.

e.g.,

3064, 4602, 4002, 9015, and 3462

Reinforce place value with students by asking what digit is in the tens column, ones column, hundreds column or thousands column. Ask students to read each numeral. Ask students to write the numeral in words.

P.O. 4.14.02.01

NAME: ______________________ CLASS; ______ DATE: ______

Match column A with column B.

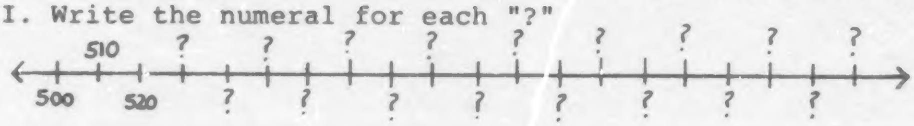
Column A	Column B
1. 10¢	a. ten dollars
2. $10.00	b. one hundred dollars
3. $100.00	c. one thousand dollars
4. $1000	d. ten meters
5. 10 meters	e. ten cents
6. 100 kilometers	f. ten centimeters
7. 10 centimeters	g. ten millimeters
8. 10 millimeters	h. one hundred kilometers

P.O. 4.14.02.02

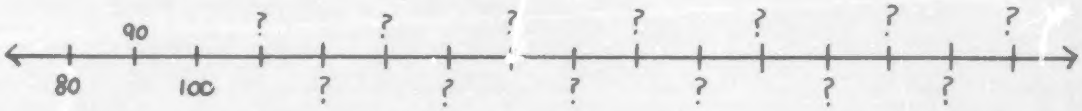
NAME: ______________________ CLASS: ________ DATE: ________

I. Write the numeral for each "?"

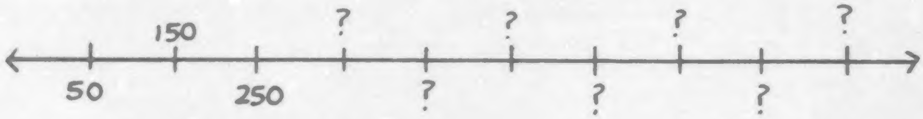
1.



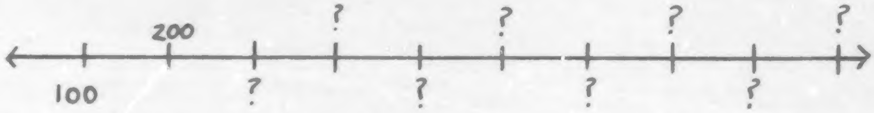
2.



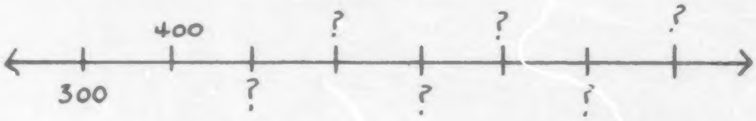
3.



4.



5.



II. Find the numeral for the ☐. Make each sentence true.

6. 500 = 400 + ☐

7. 800 = 500 + ☐

8. 400 = 300 + ☐

9. 1000 = 900 + ☐

10. 600 = 600 + ☐

III. Write > or < in the ☐ .

11. 710 ☐ 800

12. 900 ☐ 400

13. 530 ☐ 450

14. 350 ☐ 230

15. 190 ☐ 90

4.14.02.03
P.O.______________

NAME:____ CLASS:__________ DATE:________

I Read each numeral. Write the words that you say.

I.

a) 2,340 = ____

____

b) 6,034 = ____

____

c) 8,250 = ____

____

d) 604 = ____

____

e) 6,091 = ____

____

f) 4,008 = ____

____

g) 9,286 = ____

____

h) 1,010 = ____

____

Continued on the next page.

4.14.02.03
P.O.____________

NAME:____CLASS:_________DATE:_______

Match column I with column II

II

Column I	Column II
1. five thousand, six hundred twenty two	9,003
2. 4,000 + 600 + 30 + 5	4,635
3. three thousand, thirty-three	7,007
4. nine thousand, three	7,070
5. seven thousand seventy	5,622
6. seven thousand seven	3,033

4.01.01 PLACE VALUE OF 5- AND 6-DIGIT NUMBERS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.01.01.01A use a place value chart to interpret a 5-digit number;

e.g.,

Ten Thousands	Thousands	Hundreds	Tens	Ones
8	0	4	3	7

4.01.01.02A identify and write a 6-digit number in expanded notation;

e.g.,

871, 362 = 800,000 + 70,000 + 1,000 + 300 + 60 + 2

4.01.01.03A write an expanded 6-digit number in standard form.

e.g.,

800,000 + 70,000 + 1,000 + 300 + 60 + 2 = 871,362

4.01.01

VOCABULARY

TERMS

expanded notation
standard notation

GETTING STARTED

Make a set of 10 digit cards, e.g., $\boxed{0}$ .... $\boxed{9}$.
Write this on the chalkboard: ____ ____ ____.
Each blank represents a place value, the one on the right is the ones. Say, "What is the blank in the middle? (the tens) What is the blank on the left?" (the hundreds) Have each student make a copy of the blanks on his paper.

Have a student draw a card. Each student then writes the digit in whichever blank he chooses. There is no erasing. Repeat this procedure until three cards are drawn. Say, "Read the number you have written."

Write the numbers the students have formed on the chalkboard. The winner is the student who has the greatest number.

Have the students order all the numbers listed on the chalkboard.

The game can be varied by having the winner form the smallest number.

Also this can be played using 4-, 5-, 6-digit numbers.

Place 5 numerals on the chalkboard.

e.g.,
6
7 3
8 2

Ask the students to form a 5-digit number.Each student should record these numbers on a place value chart drawn on his paper. Have one student write the dictated number on the chalkboard. The students should compare their number to the one written on the chalkboard, e.g., 23,876. Say, "Using the above digits form the greatest number, (87,632); the least number (23,678).

4.01.01

4.01.01.01 **use a place value chart to interpret a 5-digit number**

STRATEGY 1: Use squared materials to show that as we go to the left in place value, the values increase ten times.

For example, place 10 ones on a ten strip to show that 10 = 10x1.
Place 10 tens on a hundred card to show that 100 = 10x10.
Count by hundreds to 1000 to show that 10x100 = 1000.
Count by 1000 to 10,000 to show that 10x1000 = 10,000.
Count by 10,000 to show that 9 ten thousands are needed to equal 90,000.

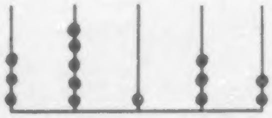
Draw a place value chart on the chalkboard.

Thousands Period			Unit Period		
hundred thousand	ten thousand	one thousand	hundreds	tens	ones

Have the students notice the repetition. Say, "What is repeated on the chart?" Ones, tens, hundreds in the thousands period. Say, "Why did I darken the line between the hundreds and one thousand column?" Elicit the response, when writing a number a comma is placed here to separate the periods.

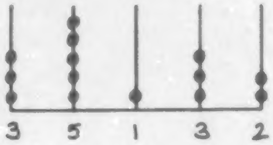
Write a number on the chart, 82,134. Say, "In which place is the 8?" Ten thousands. Continue asking the place for each digit. Repeat this with other 5-digit numbers.

STRATEGY 2: Draw an abacus on the chalkboard. Show a 5-digit number on the abacus.



Elicit the number of ones shown on the abacus.

Say, "How many ones will fit on the ones rod?" 9. "What must I do if I have 10 ones?" Elicit the response, exchange it for one ten. Continue asking how many tens are needed for a hundred; how many hundreds are needed for a thousand; how many thousands are needed for ten thousand. Next ask a student to write the number of circles under each rod.



Rewrite the number on a place value chart.

Ten thousands	Thousands	Hundreds	Tens	Ones

Say, "How many ones should I show on the place value chart?" Continue until there is a number in each place on the chart.

Write the number 35,132 on the chalkboard. Say, "Why is there a comma?" Elicit the response, the comma separates the units and thousands periods. Cover the 132 with your hand and have a student read the 35. Say, "It is read the same as 35 except that it is in the thousands period. We have 35 thousands. 132 is really 132 units but we never say 132 units." Repeat this procedure using other 5-digit numbers.

4.01.01

4.01.01.02 **identify and write a 6-digit number in expanded notation**

STRATEGY 1: Write on the chalkboard:

1) 35,692
2) 916,342
3) 4,974
4) 735,872
5) 50,941

Ask a student to come to the chalkboard to circle all 6-digit numbers. Say, "Who would like to read the numbers circles?" Record next to the answer given.
e.g., 916,342 = 9 hundred sixteen thousand, 3 hundred and 42.
Say, "Another way to write this is 900,000 + 10,000 + 6,000 + 300 + 40 + 2. We call this expanded notation.

STRATEGY 2: Draw a place value chart on the chalkboard.

Hundred thousands	Ten thousands	One thousand	Hundreds	Tens	Ones

Write a number in standard form and have the students write the number on the chart. Begin with the number 694,523.

Hundred thousands	Ten thousands	One thousand	Hundreds	Tens	Ones
6	9	4	5	2	3

Say, "What is the value of 6? 6 hundred thousands, 9? 9 ten thousands, 4? 4 thousands, 5? 5 hundreds, 2? 2 tens, 3? 3 ones." Write 694,523 = 6 hundred thousands, 9 ten thousands, 4 one thousands, 5 hundreds, 2 tens and 3 ones on the

STRATEGY 2: cont'd

chalkboard. Say, "What sign should be put between the numbers?" A plus sign because when the numbers are added together, we get 694,523.

Write on the chalkboard: 694,523 = 6 hundred thousands + 9 ten thousands + 4 one thousands + 5 hundreds + 2 tens + 3 ones or 600,000 + 90,000 + 4,000 + 500 + 20 + 3.

4.01.01.03 **write an expanded 6-digit number in standard form**

STRATEGY 1: Use tally marks to represent numbers.

e.g., 1 2 3

H	T	O
1	11	111

Say, "How many hundreds, tens and ones are there?"

Write on the chalkboard:

1 hundred 2 tens 3 ones

Say, "What does 100 + 20 + 3 = ?" (123)

Write 123 = 1 hundred 2 tens 3 ones

Draw this on the chalkboard:

Hundred thousands	Ten thousands	One thousand	Hundreds	Tens	Ones
111	1111	11	1	11	111

Ask the students to refer to the tally marks to fill in the missing numbers.

☐ hundred thousands + ☐ ten thousands +

☐ thousands + ☐ hundreds + ☐ tens + ☐ ones

Say, "What does 3 hundred thousands + 5 ten thousands + 2 thousands + 1 hundred + 2 tens + 3 ones = ?"

4.01.01

STRATEGY 1: cont'd

352,123. Write on the chalkboard:
300,000 + 50,000 + 2,000 + 100 + 20 + 3 = _ _ _ _ _
Have the students use the tally marks to help fill in the blanks. Repeat using other 6-digit numbers.

STRATEGY 2:

Write a number in expanded form on the chalkboard:

300,000 + 40,000 + 7,000 + 600 + 50 + 4

Draw a place value chart on the chalkboard.
e.g.,

Hundred thousands	Ten thousands	One thousand	Hundreds	Tens	Ones

Rewrite the expanded numeral on the chart. Say, "How many ones should be placed in the ones column? 4. How many tens in the tens column? 5. How many hundreds should be placed in the hundreds column? 6... ."Ask a student to read this number. Then write:
300,000 + 40,000 + 7,000 + 600 + 50 + 4 = _ _ _ _ _
Have the students refer to the place value chart when filling in the blanks. Repeat this procedure using other 6-digit numbers.

P.O. 4.01.01.01

NAME: ______________________ CLASS; _______ DATE: _______

Use the place value charts to answer the questions.

1.

Ten Thousands	Thousands	Hundreds	Tens	Ones
1	2	4	6	8

a) Which digit is in the hundreds place? 4

b) Which digit is in the tens place? 6

2.

Ten Thousands	Thousands	Hundreds	Tens	Ones
3	6	9	8	0

a) Which digit is in the ones place? _____

b) Which digit is in the tens thousands place? _____

3.

Ten Thousands	Thousands	Hundreds	Tens	Ones
9	3	0	6	7

a) Which digit is in the thousands place? _____

b) Which digit is in the tens place? _____

4.

Ten Thousands	Thousands	Hundreds	Tens	Ones
5	2	1	7	8

a) Which digit is in the ten thousands place? _____

b) Which digit is in the thousands place? _____

P.O. 4.01.01.01

NAME: ______________________ CLASS; ______ DATE: ______

Place value (continued)

5.

Ten Thousands	Thousands	Hundreds	Tens	Ones
7	2	5	4	1

a) Which digit is in the hundreds place? ______

b) Which digit is in the ten thousands place? _____

6.

Ten Thousands	Thousands	Hundreds	Tens	Ones
6	0	2	1	9

a) Which digit is in the thousands place? ____

b) Which digit is in the tens place? ____

P.O. 4.01.01.02

NAME: ________________________ CLASS; ______ DATE: ______

Write in expanded form.

1. 234,781 = 2 hundred thousands + 3 ten thousands + 4 thousands + 7 hundreds + 8 tens + 1 ones.

2. 512,348 = ____ hundred thousands + ____ ten thousands + ____ thousands + ____ hundreds + ____ tens + ____ ones.

3. 679,542 = ____ hundred thousands + ____ ten thousands + ____ thousands + ____ hundreds + ____ tens + ____ ones.

4. 489,012 = ____ hundred thousands + ____ ten thousands + ____ thousands + ____ hundreds + ____ tens + ____ ones.

5. 180,437 = ____ hundred thousands + ____ ten thousands + ____ thousands + ____ hundreds + ____ tens + ____ ones.

6. 234,781 = ____ hundred thousands + ____ ten thousands + ____ thousands + ____ hundreds + ____ tens + ____ ones.

7. 347,182 = 300,000 + 40,000 + 7,000 + ______ + ______ + ______.

8. 548,963 = ______ + 40,000 + ______ + ______ + ______ + ______.

9. 988,421 = 900,000 + 80,000 + ______ + ______ + ______ + ______.

10. 123,607 = ______ + ______ + ______ + ______ + ______ + ______.

P.O. 4.01.01.03

NAME: ______________________ CLASS; ________ DATE: ________

Write in standard form.

1. 7 hundred thousands + 6 ten thousands + 2 thousands + 4 hundreds + 2 tens + 1 one = 762,421.

2. 8 hundred thousands + 5 ten thousands + 1 thousands + 3 hundreds + 8 tens + 9 ones = ________.

3. 4 hundred thousands + 2 ten thousands + 9 thousands + 8 hundreds + 6 tens + 2 ones = ________.

4. 5 hundred thousands + 3 ten thousands + 2 thousands + 1 hundred + 2 tens + 4 ones = ________.

5. 6 hundred thousands + 1 ten thousand + 8 thousands + 5 hundreds + 8 tens + 7 ones = ________.

6. 600,000 + 20,000 + 7,000 + 700 + 60 + 4 = ________.

7. 900,000 + 10,000 + 6,000 + 900 + 80 + 1 = ________.

8. 100,000 + 30,000 + 5,000 + 200 + 70 + 5 = ________.

P.O. 4.01.01.03 (cont'd)

NAME: ______________________ CLASS; ________ DATE: ________

Write in standard form.

9. 200,000 + 40,000 + 6,000 + 700 + 90 + 2 = ______________

10. 400,000 + 50,000 + 9,000 + 200 + 40 + 6 = ______________.

11. 300,000 + 9,000 + 40 + 6 = ______________.

12 100,000 + 20,000 + 700 + 20 + 1 = ______________.

4.01.02 ROUND 4- AND 5-DIGIT NUMBERS

(2-3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.01.02.01A round 4-digit and 5-digit numbers to the nearest hundred;

e.g.,

5,645 is between 5,000 and 6,000
5,645 to the nearest hundred is 5,600
16,750 is between 16,700 and 17,800
16,750 to the nearest hundred is 16,800

4.01.02.02A round 4-digit and 5-digit numbers to the nearest thousand;

e.g.,

5,836 is between 5,000 and 6,000
5,836 is nearer to 6,000
5,836 rounded to the nearest thousand is 6,000
15,456 is between 15,000 and 16,000
15,456 is nearer to 15,000
15,456 rounded to the nearest thousand is 15,000

4.01.02.03A solve word problems related to skills learned in this module.

e.g., 71,348 people attended the concert in Central Park. If the number 71,348 was rounded to the nearest ten thousand, about how many people attended the concert? 71,000

4.01.02

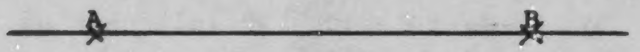
VOCABULARY

TERMS

round
midpoint

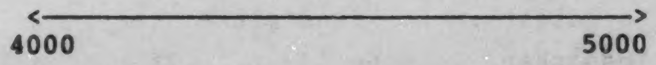
GETTING STARTED

Reinforce the concept of "betweenness." Draw a line on the chalkboard and label it, A and B.
e.g.,

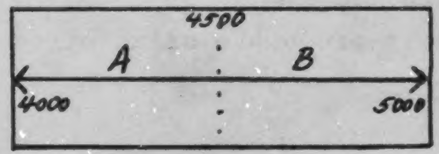


Ask a student to label a point C between A and B. Say, "Where is point C?" Elicit the response, "Between A and B."

Do a paper folding activity. Draw a number line on the paper. Mark the end points 4000 and 5000.
e.g.,



Say, "What are the end points?" (4000 and 5000) Demonstrate as you say, "Fold the paper in half." Ask, "Where would the midpoint be located?" Elicit the response, "on the fold." Say, "What should we label the point?" (4500) Label the sections A, B.
e.g.,



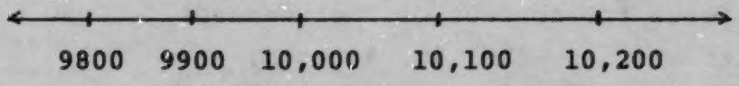
Say, "In which section of the number line would 4200 be found?" (A)

Repeat this procedure using other numbers.
e.g., 4700, 4300, 4400, 4900.

4.01.02

4.01.02.01 **round 4-digit and 5-digit numbers to the nearest hundred**

STRATEGY 1: Display a number line on the chalkboard and label it as follows:



Ask a student to locate 9870 on the number line. Say, "Between which two multiples of 100 is 9870?" Elicit the response, "9870 is between 9800 and 9900." Say, "Which numbers between 9800 and 9900 round to 9800? 9801 - 9849. Which numbers between 9800 and 9900 round to 9900?" 9850 -9899. Ask, "Why is 9870 rounded to 9900?"

Repeat this procedure with other numbers; e.g., 9802, 10,130, 10,150 ...

STRATEGY 2: To round a number to the nearest hundred, look at the digit in the tens place. Say, "If the digit is less than 5, round 'down.' If the digit is equal to or greater than 5, round 'up.'"

e.g., In 1032, 3 is less than 5, so 1032 rounds down to 1000.

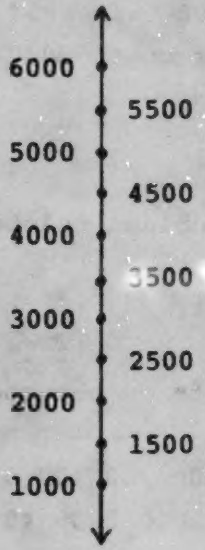
In 2275, 7 is greater than 5, so 2275 rounds up to 2300.

Repeat this procedure using other 5-digit numbers.

4.01.02.02 **round 4-digit and 5-digit numbers to the nearest thousand.**

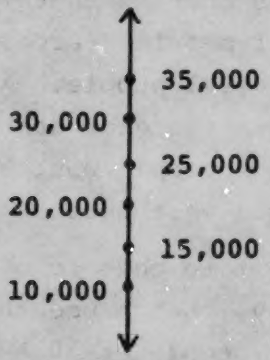
4.01.02

STRATEGY 1: Use a vertical number line. Label as follows:


6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000

Ask a student to locate 4321 on the number line. Say, "Between which two multiples of 1000 is 4321? Is it closer to 4000 or 5000?" 4000. Repeat this procedure using 5-digit numbers.

e.g.,


35,000
30,000
25,000
20,000
15,000
10,000

Say, "Locate 20,300 on the vertical number line." (continue procedure as above)

STRATEGY 2: To round a number to the nearest thousand, look at the digit in the hundreds place. Say, "If the digit is less than 5, round down. If the digit is equal to or greater than 5, round up.

STRATEGY 2: cont'd

e.g., In 4367, 3 is less than 5, so 4367 rounds down to 4000. In 4854, 8 is more than 5, so 4854 rounds up to 5000.

4.01.02.03 **solve word problems related to skills learned in this module**

STRATEGY 1: Show two charts on the chalkboard.

e.g.,

1) 0 100 200 300 400 500 600 700 800 900
2) 0 1000 2000 3000 4000 5000 6000 7000 8000

Say, "Let's try to use these charts to help the gatekeeper estimate the number of people at the World Series."

Show a large chart with this story: "At about 10 AM, 4,321 people arrived at the game. By 11 AM, there were 6,941 people. At noon there were 12,143 people. When the game started, there were 23,721 people. Some people went home in the 9th inning; 20,532 people were left."

Ask a student to come to circle all the numbers of people. Say, "Let's use the chart to estimate the hundreds of people at 10 AM." Write 4,321 on the chalkboard. Underline the hundreds: 4, 3 2 1. Say, "Look at the chart. Is 321 closer to 300 or 400?" Elicit that it is closer to 300. Say, "In the number 4,321, estimated or rounded to the nearest hundred would give us 4,300." Say, "If the problem asks us to round to the nearest hundred our answer should contain at least two zeros." If the problem asks us to round to the nearest thousand,

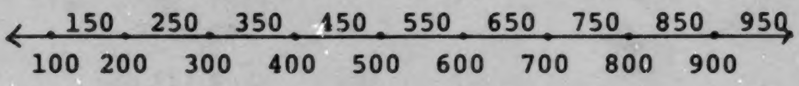
STRATEGY 1: cont'd

our answer should contain at least three zeros." Repeat this procedure for 6,941; 12,143; 23,721; 20,532.

After students have rounded these numbers to hundreds, repeat the entire procedure for rounding to thousands, using the 2nd chart.

STRATEGY 2:

Show chart with midpoints.



Ask, "What number is in each midpoint?" Elicit the response, fifty. Say, "Fifty is the midpoint for each set of hundreds. A number less than 150 is closer to 100. A number more than 150 is closer to 200."

Ask students to make a list of all the things that cost thousands of dollars, e.g., stereo unit, car, house, boat, castle. Say, "Sometimes we want to estimate the cost to know about how much something costs."

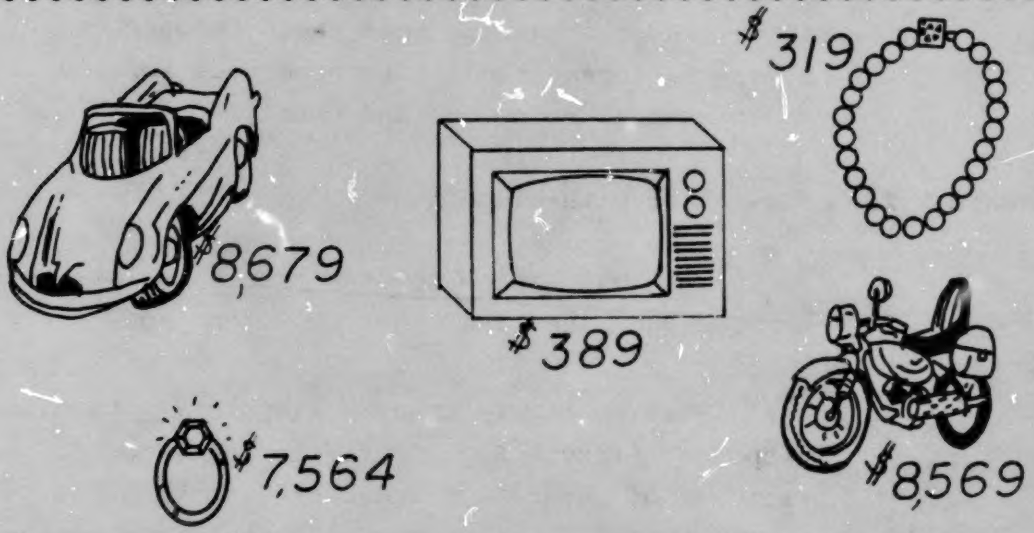
Ask a student come to the chalkboard to write one of his items, e.g., stereo unit: $1,453. Say, "Let's estimate or round to the nearest hundred. Look at the hundred chart." Ask, "What can you tell about the position of 453. What hundreds is it closer to?" Elicit the response, 500. Say, "We can round $1,453 to the nearest hundred. We say $1,500." Repeat this procedure for rounding to thousands.

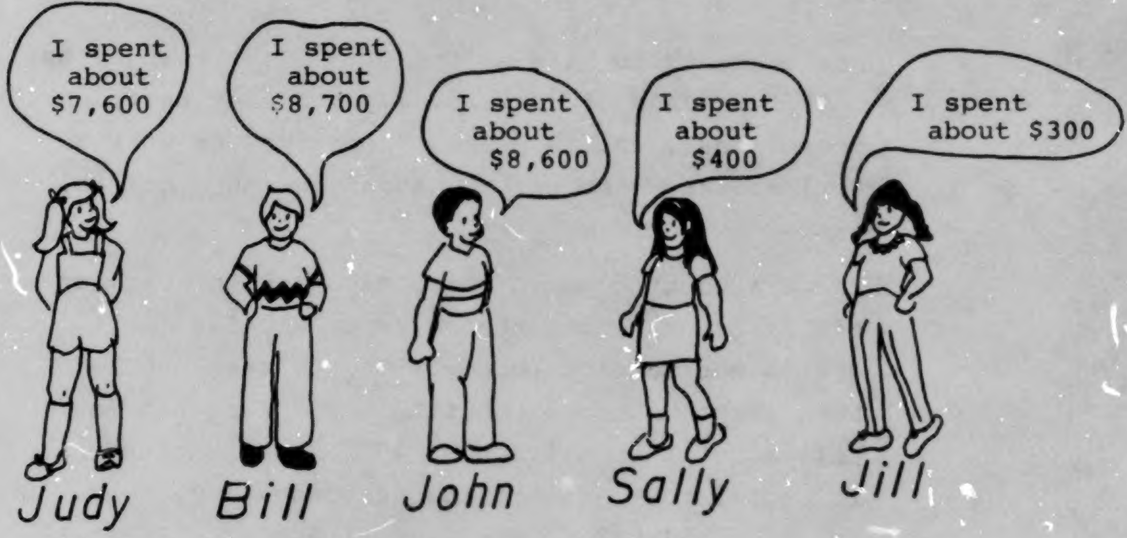
Ask students to write their costs in story form. e.g., "I would like to buy a car for ___, a house for ____." Ask students to exchange their papers with a neighbor to have him estimate each cost in hundreds of dollars, then thousands of dollars.

P.O. 4.01.02.01

NAME: ______________________ CLASS: ________ DATE: ________

Directions: Round the prices to find out who bought each item.


$319
$8679
$389
$7,564
$8,569


I spent about $7,600
I spent about $8,700
I spent about $8,600
I spent about $400
I spent about $300
Judy
Bill
John
Sally
Jill

What did Judy buy? ______________________

Who bought the motorcycle? ______________________

What did Bill Buy? ______________________

Who bought the T.V.? ______________________

P.O. 4.01.02.02

NAME: ______________________ CLASS: ________ DATE: ________

1. Round these numbers to the nearest thousand.
2. Write "true" for numbers that are rounded to nearest thousand and "false" for those that are not.

①

5,321 rounds to 5,000	4,018 rounds to ______	3,551 rounds to ______
5,921 rounds to ______	4,612 rounds to ______	3,575 rounds to ______
13,421 rounds to ______	24,572 rounds to ______	81,918 rounds to ______

②

4,391 rounds to 4,000 ____________

5,583 rounds to 5,000 ____________

7,821 rounds to 7,000 ____________

7,821 rounds to 8,000 ____________

③ A new car cost $8,941
About how many thousands of dollars is this? ____________
(Hint: Round to nearest thousand.)

A stereo cost $1,031. About how many thousand of dollars is this? ____________

A house cost $65,999. About how many thousand of dollars is this?

____

P.O. 4.01.02.03

NAME:____________________ CLASS:__________ DATE:__________

1. Solve these problems.
2. Round each number to nearest thousand.

1.

9,316 people were at the parade. About how many thousands of people were there? 9,000

4,394 pencils were ordered. About how many hundreds of pencils were there?__________

25,624 people attended the rally. Estimate the number of people to the nearest thousand.

____

A house cost $69,123. Estimate the cost by rounding to the nearest thousand.

____

2.

5,916__________
4,346__________
15,891__________
25,216__________
27,816__________
34,912__________
32,012__________
47,231__________

6,112__________
7,024__________
8,991__________
72,041__________
83,741__________
62,891__________
74,816__________
72,019__________

4.13.02 PROBLEM SOLVING: USE GRAPHS TO LOCATE INFORMATION

(2-3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.13.02.01A locate information on a table/chart in order to solve problem;
e.g.,

Name	Bridge Length	Year Completed
Brooklyn	486 m	1883
Manhattan	448 m	1909
Verrazano	1298 m	1964

Which bridge was completed in 1964?

Which bridge is 486 m in length?

4.13.02.02A solve problems based upon a set of data;
e.g.,

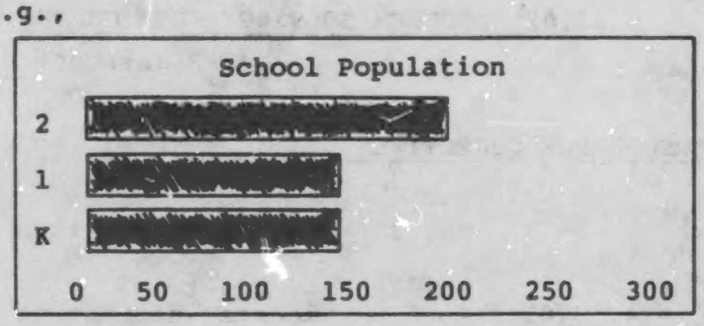
Use same chart.

How many years older is the Manhattan Bridge than the Verrazano Bridge?

107

4.13.02.03A locate information on a graph in order to solve problems;

e.g.,



How many students are in 1st grade?

2nd grade? Kindergarten?

Which grade has 200 youngsters?

4.13.02.04A solve problems based upon data found on a graph.

e.g.,

Use same graph as above.

How many more students are in grade two than in grade one?

Which grades have the same number of students?

How many students are in all grades?

4.13.02

VOCABULARY

TERMS

data
graph
chart
table

GETTING STARTED

Draw the following chart on the chalkboard.

e.g.,

Sandwiches		Drinks	
Turkey	$1.60	Milk	$.55
Salami	1.75	Coffee	.50
Special	1.45	Juice	.85
Submarine	2.25	Shake	.90
Cheese	1.25		

"What would you order for lunch if this was today's menu?" Ask a student to tell what he would order. Have the student come to the chart, circle the items he chose and compute the total cost. Repeat this procedure with several students.

Ask, "What would be the most expensive sandwich and drink that could be ordered?" Ask a student to respond and have him/her explain his/her choice. Elicit the response, "I chose the most expensive sandwich and the most expensive drink." Ask a student to determine the least expensive meal. Discuss the response, e.g. "The cheese sandwich is the cheapest sandwich and coffee is the least expensive drink."

Write the name of each sandwich and each drink on a separate index card. Ask a student to select one sandwich card and one drink card. The student determines the cost of his meal by referring to the chart. Repeat this procedure using several different combinations.

GETTING STARTED cont'd

Distribute newspapers or a duplicated copy of a sports page to students. Help students locate the baseball standings. (Basketball or football standings can be used during the winter.) Ask, "Which team has won the most games? How many games have they won? How many games have they lost?"

Discuss the vast amount of information that can be derived from a simple table. "What other information can we get from this table?" Elicit such responses as, "We can tell how many games the Mets have lost, how many games were played in all...."

Ask students to locate other tables of information on the same page, e.g., ballplayers' batting averages, salaries earned by different golfers, the ranking of heavyweight boxers....

4.13.02

4.13.02.01 **locate information on a table/chart in order to solve problems**

STRATEGY 1: Distribute a newspaper or a duplicate copy of the daily weather page. Ask students to locate the table labeled "Temperature of U.S. Cities." Discuss the information that this table provides. e.g., Yesterday's high temperature in the city, yesterday's lowest temperature in that city, whether it was rainy, cloudy ... Say, "Which city had the highest temperature? How do you know?" Elicit the response, the temperature of Phoenix was 110° and no other city had a temperature that high. "Which city had the coolest temperature? Explain how you arrived at your answer."

"Locate several cities that had the same high temperature." List these cities on the chalkboard and record the high temperatures for each.

"Use the 'Temperature of U.S. Cities' table to locate any cities with the same high temperature as New York, the same low temperature as New York ...

STRATEGY 2: Display the following chart on the chalkboard or with an overhead projector.

Planets in our Solar System

Planet	Distance from the sun in millions of miles	Diameter in miles
Mercury	36	3,100
Venus	67	7,600
Earth	93	7,918
Mars	142	4,200
Jupiter	483	87,000
Saturn	886	72,000
Uranus	1780	33,200
Neptune	2970	31,000
Pluto	3670	1,500

STRATEGY 2: cont'd

Ask a student to read the title of the chart and the heading of each column. Discuss the type of information that can be determined from this chart. e.g., how far each planet is from the sun, the size of each planet.

Say, "Which planet is nearest the sun?" (Mercury) "How can you be sure?" Elicit that all the other planets are more than 36 million miles from the sun. "Which planet is farthest from the sun? Explain how you arrived at your answer using the chart."

"Which is the smallest planet?" (Pluto) Reinforce what a diameter is. Elicit that Pluto is the smallest planet because it has the shortest diameter. "List the nine planets in order from smallest to largest using the chart. Check results against the chart."

4.13.02.02 solve problems based upon a set of data

STRATEGY 1:

Provide students with a newspaper or a duplicate copy of a daily weather page. Have students locate the "Temperature of U.S. Cities" table. Reinforce that this table can be used to determine the high and low temperature of a U.S. city for the preceding day.

Ask, "How many degrees hotter was it in Phoenix than New York?" Ask a student to come to the chalkboard and record the high temperature for each city.

e.g., 110° Phoenix
96° New York

112

STRATEGY 1: cont'd

"What do we have to do with this information in order to solve the problem?" Elicit the response that we must subtract because we are determining a difference between two numbers. Have the student at the chalkboard perform the subtraction.

e.g.,

110°	Phoenix
-96	New York
14°	difference

Repeat this procedure using other examples. e.g., What was the difference between Boston's highest and lowest temperature? Which city had the greatest range from its highest to lowest temperatures?

STRATEGY 2: Draw this chart on the chalkboard.

e.g.,

Population of Our School

Grade	Boys	Girls	Total
K	18	24	42
1st	31	24	55
2nd	16	28	44
3rd	28	28	56
4th	31	30	61
5th	39	17	56
6th	20	26	46

Say, "Suppose you were in charge of the school lunchroom. In about one hour the early lunch period, which includes grades 1, 2 and 3, will begin. Could you use this chart to determine how many lunches you need to prepare? How?" Elicit that we can use the chart to determine how many students are in each grade. "We are going to use the chart to solve other problems."

e.g., "How many lunches would you need to feed the grades coming to the first lunch period?" Use the

4.13.02

STRATEGY 2: cont'd

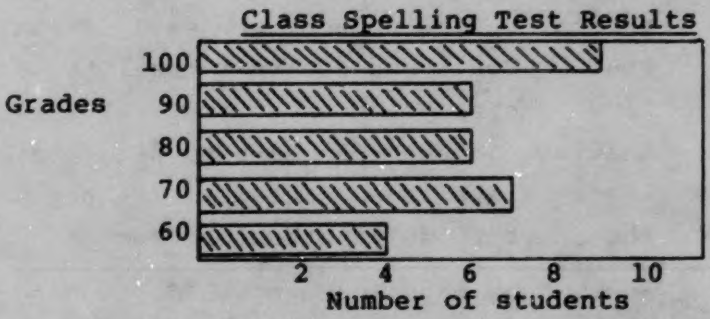
chart and circle the information that are needed to solve this problem. "What must be done with this information in order to determine how many lunches need to be prepared?" Elicit the response, we must add 55, 44 and 56 because we are finding the total number of students in grades 1, 2 and 3.

Repeat this procedure using other examples.
e.g., (1) Grades 5 and 6 girls will be going to sewing class this afternoon. How many needles will the sewing teacher need?

(2) Mr. Brown is taking grades 3 through 6 on a school picnic. How many students will be going on this trip?

4.13.02.03 **locate information on a graph in order to solve problems**

STRATEGY 1: Draw a bar graph showing the results of a recent class spelling test on the chalkboard.
e.g.,



Explain that this graph shows how the class as a whole did on the recent spelling test. Reinforce that the numbers on the bottom of the chart represent the number of students receiving a

STRATEGY 1: cont'd

particular score and that the numbers on the side represent the test scores.

Ask, "What was the most common score?" Elicit that 100 was the most common score because more students received 100 than any other score. Next ask, "How can we determine how many students received 100 on the test?" Elicit that we must compare the length of the bar to the right of the 100 to the numbers on the bottom of the graph. Since the bar is between the 8 and the 10, we know that 9 students received a score of 100. "Can we use the graph to determine which students received a 100 on the test?" Discuss that there are certain kinds of information that we cannot get from looking at a graph.

Have students use the graph to locate information.

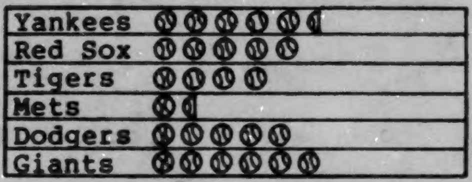
e.g., How many students received a score of 90? What other score were received by the same number of students?

STRATEGY 2:

You will need to prepare a picture graph with the names of various baseball teams and the number of games they have won.

e.g.,

Number of Games Won



Each ⚾ stands for 6 games won.

Say, "Suppose you were told that you will get a free ticket to see the World Series if you correctly choose the team that finishes in 1st place. Which team would you choose?" Elicit that the Giants would be the best selection because they

STRATEGY 2: cont'd

won the most games. Ask, "Which team would be a good 2nd choice?" Discuss why the Yankees would be a good 2nd choice. Elicit that they won almost as many games as the Giants. "How many more games have the Giants won than the Yankees?" Reinforce that a half of a baseball represents 3 games won. Ask a student to come to the chart and determine how many games the Yankees and Giants have each won. The student records his findings.

e.g.,

36 games won for Giants
33 games won for Yankees

Say, "What operation do we use on these numbers to determine the solution to this problem?" Elicit that we must subtract because we are finding the difference between two numbers.

Ask students to solve problems based upon the data found in this picture graph.

e.g.,

How many more games have the Yankees won than the Mets?

Which two teams have won a total of 45 games?

How many games have been won by all the teams listed? ...

4.13.02.04 **solve problems based upon data found on a graph**

STRATEGY 1: Display a bar graph showing the results of a recent class spelling test. Reinforce that there are many kinds of information that can be determined from this graph; e.g., how many students received a particular score, which score was obtained by the most students, ... Discuss

STRATEGY 1: cont'd

that there are some kinds of information that can not be determined by reading a graph; e.g., what score a particular student received.

Ask, "How many more students received a grade of 100 than received an 80?" Ask a student to come to the chalkboard and record the number of students receiving 100 and the number receiving an 80.

e.g.,
9 students received 100
6 students received 80

"What must we do to determine how many more students received a 100 than received 80?" Elicit that we must subtract because we are finding a difference between two numbers. Have the student at the chalkboard perform the subtraction.

e.g.,

$$\begin{array}{r} 9 \\ -\underline{6} \\ 3 \end{array}$$

3 more students received 100 than received an 80

"How can we determine how many students took the spelling test?" Elicit that we need to count how many students received each score. Ask a student to come to the chalkboard and record the number of students receiving each score and add to find the total.

Repeat this procedure using other examples.

e.g.,

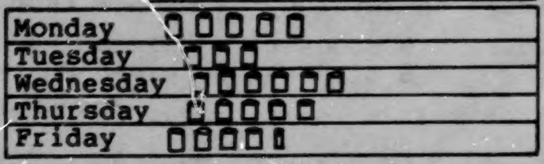
How many students received a grade of 80 or higher?

If a score of 75 is needed to pass, how many students failed the test?

4.13.02

STRATEGY 2: Say, "A fourth grade class decided to raise money by collecting aluminum cans for a week. This picture graph shows how many cans they collected each day." Draw the following picture graph on the chalkboard.

Cans Collected Each Day



Each ▯ stands for 4 cans

"On which day did the class collect the most cans?" Ask a student to come to the graph and explain how he determined on which day the most cans were collected. Elicit the response, Wednesday has the most cans next to it. Reinforce that each picture of a can represents 4 cans collected by having the students write a 4 on each can to the right of the word Wednesday. "How many cans were collected on Wednesday?" Count the cans to determine that 24 cans were collected on Wednesday. Discuss what a half can, ▯ , represents.

Repeat this procedure to determine on which day the fewest cans were collected. "How many cans were collected on Friday? On which days were the same number of cans collected?"

P.O. 4.13.02.01

NAME:________________________ CLASS:________ DATE:________

Use the chart to answer each question.

Cost to operate Home Appliances.

Appliances	Cost per month
Clock	$ .08
Oven	4.95
Refrigerator	3.16
Water heater	12.60
Color T.V.	2.15
Washing Machine	.45
Lights	5.85

1. Which is the cheapest appliance to operate? The clock.
2. Which is the most expensive appliance to operate?____________
3. What is the cost per month to operate an oven?____________
4. Which is more expensive to operate, a refrigerator or a color T.V.? ____________
5. Which appliance costs $.45 a month to operate?____________
6. What is the monthly cost of operating a water heater?____________
7. What appliance costs over $10.00 a month to operate?____________
8. What is the cost of lights for a month?____________

P.O. 4.13.02.02

NAME:____________________ CLASS:________ DATE:_______

Use the chart to help you solve each problem.

Cost to operate Home Appliances

Appliance	Cost per month
Clock	$ .08
Oven	4.95
Refrigerator	3.16
Water heater	12.60
Color T.V.	2.15
Washing Machine	.45
Lights	5.85

1. How much more expensive is it to operate a color T.V. than a washing machine?

$$\begin{array}{r} \$2.15 \\ -\ \ 45 \\ \hline \$1.70 \end{array}$$

2. What is the cost per month of operating a water heater and an oven?

3. What would be the cost of operating a clock for an entire year?

4. How much cheaper is it to use a refrigerator than a water heater?

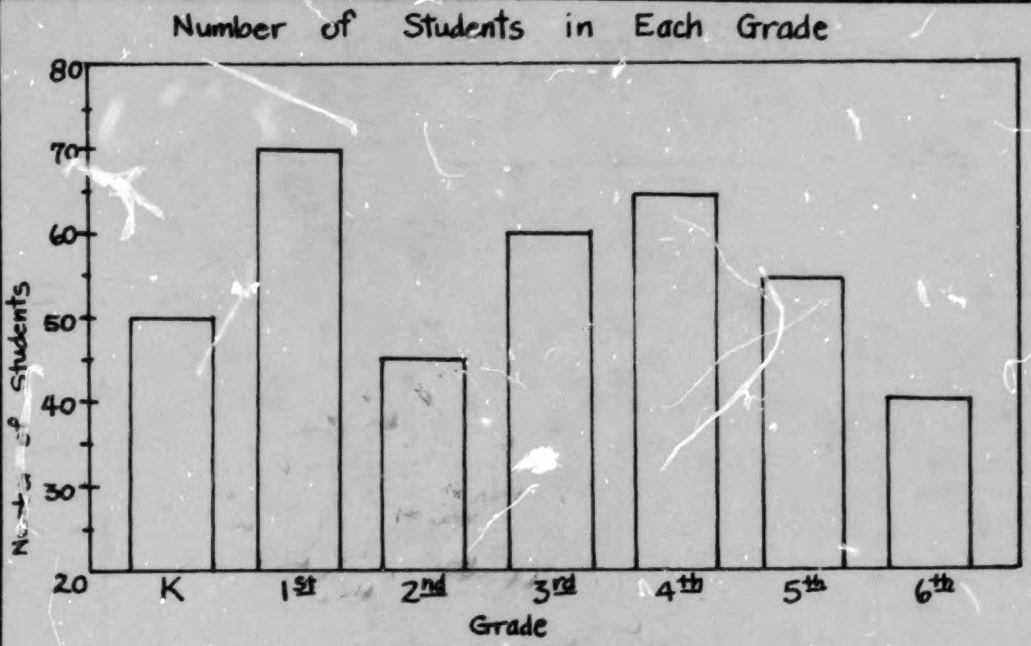
5. What is the cost per month of operating lights, an oven, and a clock?

6. What would be the cost of operating a color T.V. for a whole year?

P.O. 4.13.02.03

NAME:________________________________ CLASS:__________ DATE:________

Use the graph to answer each question.


Number of Students in Each Grade

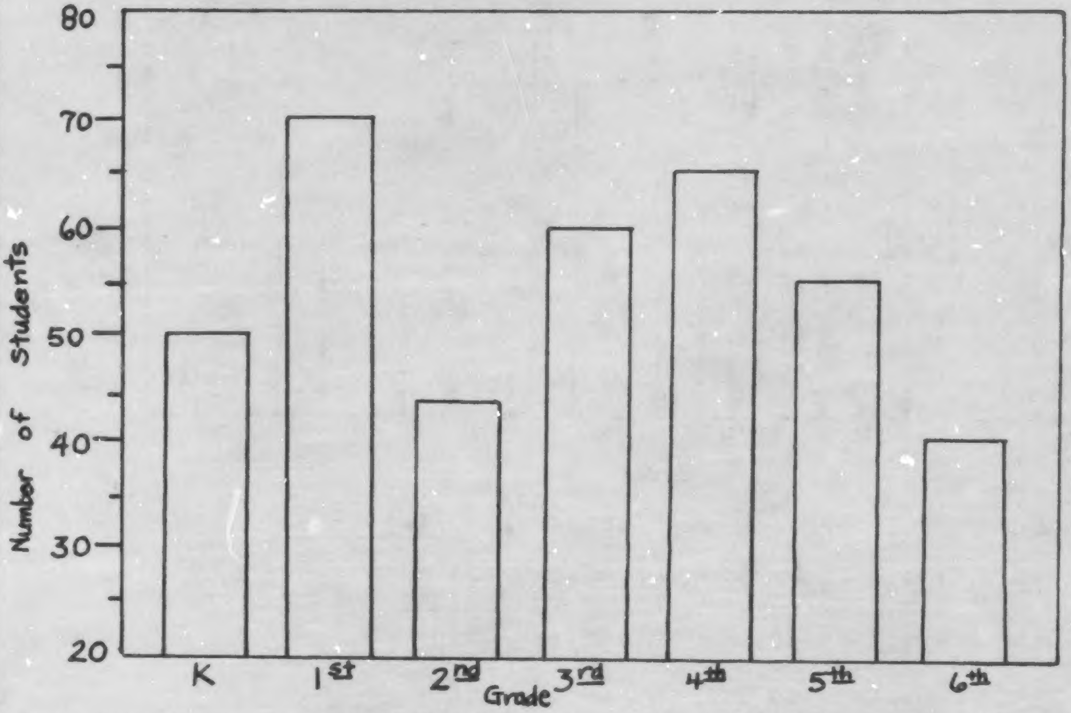
1. Which grade has the most students? 1st grade
2. Which grade has the fewest students?__________
3. How many students are in the 6th grade?__________
4. How many students are in the 2nd grade? __________
5. Which grade has more students, grade 4 or grade 5?__________
6. Which grades have more students than the 3rd grade?__________
7. Which grades have fewer students than the Kindergarten?__________
8. How many students are in the Kindergarten?________________

P.O. 4.13.02.04

NAME:____CLASS:_________DATE:_______

Use the graph to help you solve each problem.

NUMBER OF STUDENTS IN EACH GRADE



1. How many more students are in grade 1 than in grade 2?

$$\begin{array}{r} 70 \\ -45 \\ \hline 25 \end{array}$$ more students.

2. How many students are in the 4th and 5th grades?

P.O. 4.13.02.04 (cont'd)

NAME:____CLASS:_________DATE:_______

Use the graph to help you solve each problem.

3. Which two grades have a total of 130 students?

4. How many students are in the two smallest grades?

5. How many more students are in grade 4 than grade 6?

6. How many less students are in grade 2 than in Kindergarten?

7. How many teachers are there in this school?

8. How many students are in the entire school?

Unit 9

4.14.03 REVIEW - ADDITION

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.14.03.01 compute sums of 2- and 3-digit numbers without regrouping;

e.g.,

$$\begin{array}{r} 47 \\ +32 \\ \hline 79 \end{array} \qquad \begin{array}{r} 342 \\ +456 \\ \hline 798 \end{array}$$

4.14.03.02 compute sums of 2- and 3-digit numbers with regrouping.

e.g.,

$$\begin{array}{r} \overset{1}{2}5 \\ +17 \\ \hline 42 \end{array} \qquad \begin{array}{r} 3\overset{1}{2}6 \\ +148 \\ \hline 474 \end{array}$$

4.14.03

VOCABULARY

TERMS

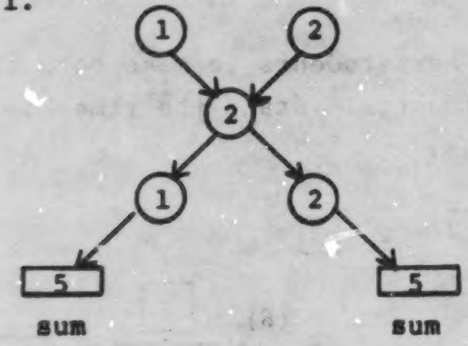
sum

GETTING STARTED

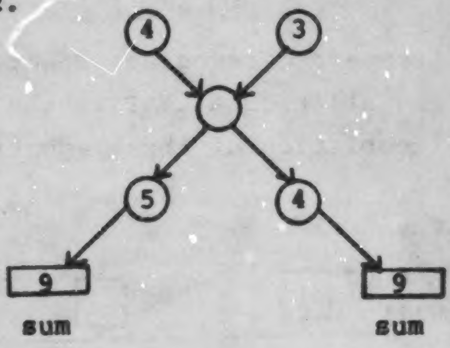
Give students a rexograph sheet with the following examples. This game is called "Beat the Clock." The students have two minutes to complete the examples. Say to students, "Do not start until I say go." Say, "Go."

Fill in the missing numbers by adding.

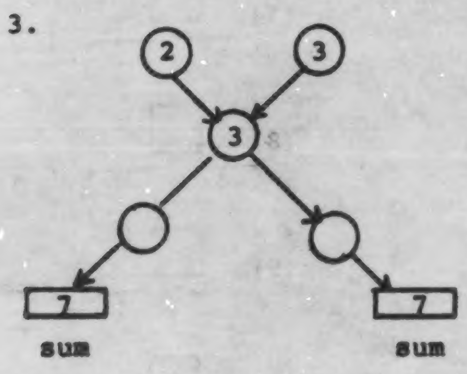
1.


1
2
2
1
2
5
5
sum
sum

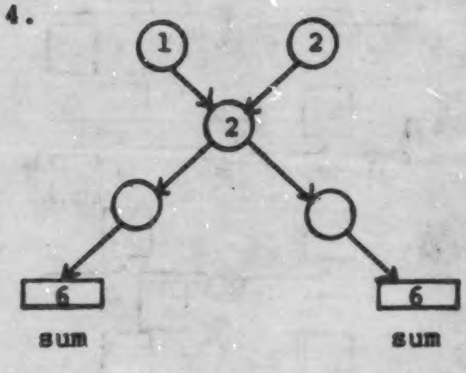
2.


4
3
5
4
9
9
sum
sum

3.

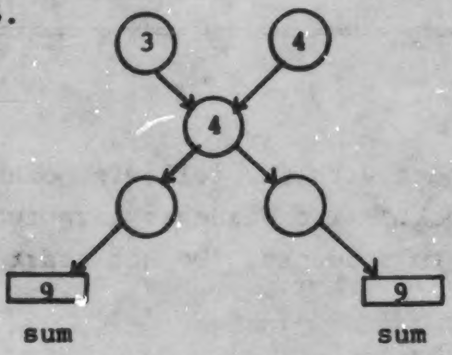

2
3
3
7
7
sum
sum

4.

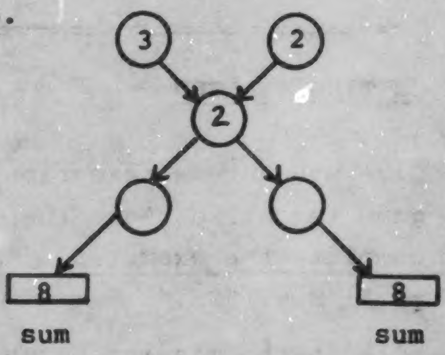

1
2
2
6
6
sum
sum

GETTING STARTED cont'd

5.



6.



Prepare a rexograph sheet. Ask students to make both sides of the equation equal. Time the students. State the time limit for the completion of these equations.

$$\overbrace{1 + 4}^{5} = \overbrace{2 + \boxed{3}}^{5}$$

(1) $\overbrace{1 + 0}^{\square} = \overbrace{0 + \square}^{\square}$

(2) $\overbrace{2 + 0}^{\square} = \overbrace{1 + \square}^{\square}$

(3) $\overbrace{1 + 2}^{\square} = \overbrace{0 + \square}^{\square}$

(4) $\overbrace{2 + 1}^{\square} = \overbrace{\square + 3}^{\square}$

(5) $\overbrace{1 + 1}^{\square} = \overbrace{\square + 2}^{\square}$

(6) $\overbrace{3 + 1}^{\square} = \overbrace{\square + 2}^{\square}$

(7) $\overbrace{3 + 2}^{\square} = \overbrace{0 + \square}^{\square}$

(8) $\overbrace{4 + 0}^{\square} = \overbrace{0 + \square}^{\square}$

(9) $\overbrace{2 + 2}^{\square} = \overbrace{\square + 1}^{\square}$

(10) $\overbrace{1 + 2}^{\square} = \overbrace{0 + \square}^{\square}$

4.14.03

4.14.03.01 **compute sums of 2 and 3 digit numbers without regrouping**

STRATEGY 1: Write the following example on the chalkboard.

$$\begin{array}{r} 674 \\ \underline{+125} \end{array}$$

Ask, "What are the steps we would use to find the sum?"

Step 1 $\begin{array}{r} 674 \\ \underline{+125} \end{array}$

add ones column 9

Step 2 $\begin{array}{r} 674 \\ \underline{+125} \end{array}$

add tens column 99

Step 3 $\begin{array}{r} 674 \\ \underline{+125} \end{array}$

add hundreds column 799

STRATEGY 2: Write the following examples on the chalkboard.

1)

tens	ones
2	3
+ 4	5

2)

hundreds	tens	ones
1	6	4
+ 1	0	5

Ask students to add the digits in the ones column. Say, "What is the sum of the digits in the ones column? What is the sum of the digits in the tens column; hundreds column? Find the sum of 764 and 105?"

127

4.14.03

4.14.03.02 **complete sums of two and three digit numbers with regrouping**

STRATEGY 1: Write the following problem on the chalkboard.

(1)

	tens	ones
	5	6
+	3	7

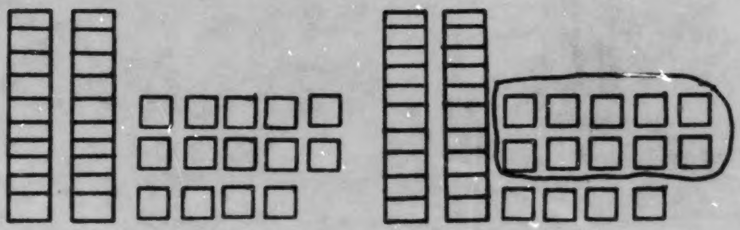
(2)

	hundreds	tens	ones
	4	3	7
+	2	8	6

Ask students to regroup 56 and 37 into tens and ones. Say, "Which column should we begin to add?" Elicit the response, begin in the ones column. "Add the ones." Elicit the response, 6+7 = 13. "Regroup 13 into tens and ones. Place the one ten in the memory box over the tens column. Now add the digits in the tens column." 1 ten + 5 tens + 3 tens = 9 tens. "What is the sum of 56 and 37?" Repeat the same procedure to do example 2.

STRATEGY 2: Say, "Let's pretend that we have visitors from the planet Mars in our class." Ask a student to please explain to the visitors how we add whole numbers with regrouping. Say, "In order for them to get back to Mars you must teach them to add whole numbers." Ask the student teacher to explain how we regroup a number.

e.g.,



2 tens 14 ones 3 tens 4 ones 34

STRATEGY 2: cont'd

Give the student squared materials to show how we regroup a number when there is more than ten ones.

Ask student to show the steps on the chalkboard. e.g.,

	tens	ones	
Step 1)	4	6	Add the ones.
	+ 3	9	Regroup the ones to make one more ten

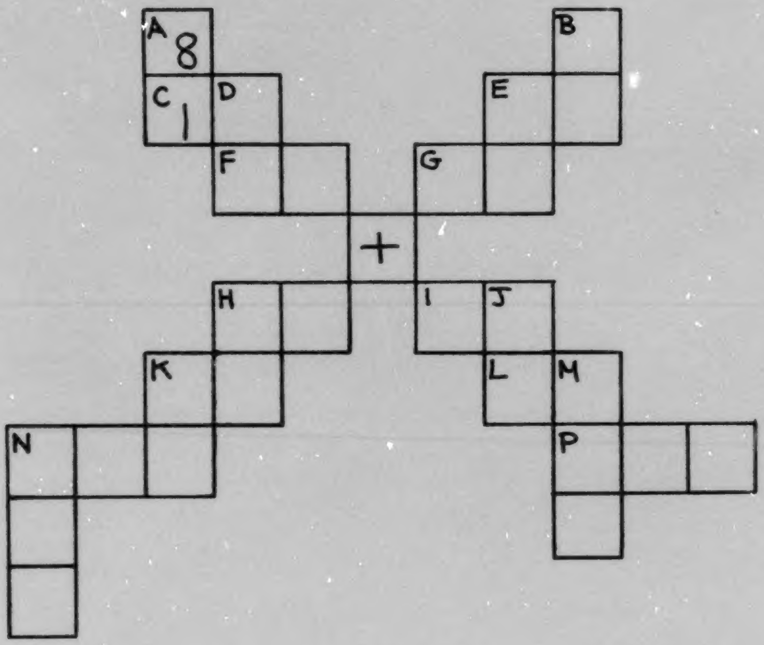
	tens	ones	
	1		
Step 2)	4	6	
	+ 3	9	Add the tens
	8	5	

Repeat the procedure using other examples. Ask other students to teach the visitors from outer space.

P.O. 4.14.03.01

NAME: ____________________ CLASS: __________ DATE: ________

Find the sums to complete the cross number puzzle.


A
8
B
C
1
D
E
F
G
+
H
I
J
K
L
M
N
P

Across

A. 2
+6

H. 15
+12

B. 306
+442

I. 25
+31

Down

A. 30
+51

J. 42
+24

B. 51
+21

K. 8
+8

P.O. 4.14.03.01 (cont'd)

NAME: ______________________ CLASS: ________ DATE: ________

Find the sums to complete the cross number puzzle.

Across

C. 6
+5

E. 11
+11

F. 52
+41

G. 21
+12

K. 12
+ 5

L. 54
+14

N. 203
+333

P. 507
+362

Down

D. 12
+ 7

E. 12
+11

H. 14
+13

M. 563
+321

N. 246
+303

P.O. 4.14.03.02

NAME: ____________________ CLASS: __________ DATE: ________

Find the sums. Complete the cross number puzzle.

A		■	B		C	■
	■	D		■	E	
F	G		■	H		
■	I		J	■	■	■
K	■	■	L	M	N	■
P			■	Q		

ACROSS

A. 25
+17

H. 136
+134

B. 326
+248

I. 419
+424

DOWN

A. 339
+148

J. 17
+17

B. 39
+19

K. 27
+22

4.14.03.02 (cont'd)

P.O. ____________

NAME: ____ CLASS: __________ DATE: ________

Find the sums. Complete the cross number puzzle.

ACROSS

D. 19
+19

E. 37
+27

F. 529
+223

L. 359
+105

P. 609
+357

Q. 328
+449

DOWN

C. 228
+239

D. 208
+116

G. 29
+29

M. 59
+ 8

N. 28
+19

4.02.01 ADDITION OF NUMBERS THROUGH 4-DIGITS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.02.01.01A add 3 or more addends in vertical format and check;

e.g.,

$$\begin{array}{rcrcl} & & \underline{\text{check}} & & \\ 3{,}586 & & 3{,}586 & \uparrow & \\ 213 & & 213 & & \text{add} \\ 1{,}224 & & 1{,}224 & & \text{up} \\ \underline{12} & & \underline{12} & & \\ 5{,}035 & & 5{,}035 & & \end{array}$$

4.02.01.02A rewrite a horizontal algorithm in correct vertical format and check;

e.g.,

$$\begin{array}{lcr} & & \underline{\text{check}} \\ 3{,}586 + 1{,}213 = 4{,}799 & & 3{,}586 \\ & & \underline{+1{,}213} \\ & & 4{,}799 \end{array}$$

4.02.01.03A estimate sums by rounding addends to the largest place;

e.g.,

$$\begin{array}{rcr} 4{,}742 & \text{rounds to} & 5{,}000 \\ \underline{3{,}116} & \text{rounds to} & \underline{3{,}000} \\ 7{,}858 & & 8{,}000 \end{array}$$

4.02.01.04A solve word problems related to skills learned in this module.

e.g.,

1,482 students attend P.S. 124, 3,040 students attend P.S. 88, and 655 students attend P.S. 92. What is the total student population of the three schools added together?

$$\begin{array}{r} 1{,}482 \\ 3{,}040 \\ \underline{655} \\ 5{,}177 \end{array} \text{ students}$$

4.02.01

VOCABULARY

TERMS

addends
sum
rounding

GETTING STARTED

Prepare about 20 large oak tag cards, each showing a digit, e.g., $\boxed{2}\ \boxed{4}\ \boxed{7}$. Draw a place value chart on chalkboard or use an oak tag chart for ones through thousand.

e.g.,

thousands	hundreds	tens	ones

Place three oak tag cards on the chalkboard ledge, e.g., $\boxed{7}\ \boxed{3}\ \boxed{2}$. Ask, "Where do you think the 7 should be placed on the chart?" Elicit in the column labeled hundreds. Ask a student to come to the chalkboard to place the 7 under the hundreds. Ask, "Where do you think the 2 should be placed?" Elicit in the ones column. Have a student place the 2 under the ones on the chart. Ask, "Where does the 3 belong?" Elicit it belongs in the tens column. Ask a student to place the 3 in the tens place on the chart. Repeat this procedure for 4-digit numbers.

Write the digits 1 through 9 on the chalkboard. Ask the first row of students to add on their papers any two digits that have a sum of 13. Ask the next row of students to add any two digits that will have a sum of 14.

Repeat this procedure for all remaining rows of students, using sums of 15, 16, 17. Select a leader from each row to come to the chalkboard to write all the equations for his row.

e.g.,

Row 1: 6 + 7 = 13, 9 + 4 = 13, 8 + 5 = 13.

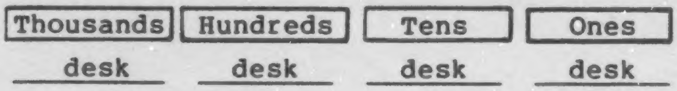
4.02.01

4.02.01.01 **add 3 or more addends in vertical format and check**

STRATEGY 1: Prepare rexographed thousand dollar bills $1000, hundred dollar bills $100, ten dollar bills $10, and one dollar bills $1.

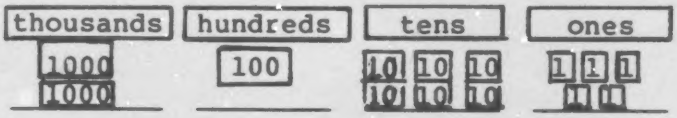
Place 4 oaktag charts reading ones, tens, hundreds and thousands on chalkboard ledge and place a few students' desks against the chalkboard in the following order.

e.g.,



Say, "Let's imagine that Jimmy is a college student and is saving money for college. He saved $2165 from summer jobs. He took the money to the bank and the clerk placed the bills into the following compartments: thousands, hundreds, tens and ones." Ask a student to select $2165 from the rexographed money and place the thousand dollar bills on the desk where the thousands chart is, the hundred dollar bills on the desk for the hundreds, the ten dollar bills where the tens chart is and the one dollar bills where the ones chart is.

e.g.,



Bills should be stacked in piles. The two thousand dollar bills should be placed one on top of the other.

Ask a student to come to the chalkboard to write the amount of money that was placed in the bank.

STRATEGY 1:
cont'd

Enter the student's number.

e.g.,

Thousands	Hundreds	Tens	Ones
2	1	6	5

Say, "Jimmy placed $213 in the bank in the fall." Ask a student to find $213 of the rexographed bills, and to place the hundreds, tens and ones on the desks where they belong. Bills should be stacked in piles. Write $213 on the chalkboard under 2,165.

e.g.,

Thousands	Hundreds	Tens	Ones
2	1	6	5
	2	1	3

"After the holidays, Jimmy put another $24 in the bank." Ask a student to find $24 in rexographed money and place it in front of the tens and ones charts. "Enter the 24 under the other numbers." Reinforce that we had 2 ten dollar bills and 4 one dollar bills.

e.g.,

Thousands	Hundreds	Tens	Ones
2	1	6	5
	2	1	3
		2	4

"How can we find out how much money Jimmy saved in all?" Elicit the response, "we add." "Who would like to add the one dollar bills? ...to add the ones column?" Elicit the response from both students, "12 ones." "How can we express 12 ones?" Elicit the response, "as one ten and 2 ones." Exchange 10 of the one dollar bills for a ten

STRATEGY 1: cont'd

dollar bill. Show the following on the chalkboard. e.g.,

Thousands	Hundreds	Tens	Ones
2	1	6	5
	2	1	3
		2	4

Ask 2 other students to come to add the ten dollar bills in the tens column. Repeat this procedure for hundreds and thousands. Reinforce that in order to add 5, 3 and 4, add the 5 and 3 first, then the 4. "In addition of 3 numbers I can add any 2 addends together, then add the remaining addend. I can add the 4 and 3 first, then the 5. I can check my answer this way."

STRATEGY 2: Say, "Billy is helping the clerk with attendance records." Ask a student to read the following information from a chart: "On Friday one thousand, three hundred forty seven students were in school. One hundred twenty one students were absent. Two hundred thirty five students were on a trip. How many students would have been in school if everyone remained in the school building on Friday?" Place 4 oaktag charts on the chalkboard, e.g., thousands, hundreds, tens, ones. Ask a student to write the first number, 1347, on the chalkboard, placing each digit in its proper place. Repeat this procedure for 21 and 235.

e.g.,

Thousands	Hundreds	Tens	Ones
1	3	4	7
		2	1
	2	3	5

"How can we find how many students should have been in school on Friday?" (add.)

4.02.01

STRATEGY 2: cont'd

"Let's add the ones column." Reinforce that we can add the 7 and 1, and then add on the 5 or we can add the 1 and 5, and then add on the 7.

Method 1

$$\begin{array}{cccccl} & 1 & 3 & 4 & 7 & \\ & & & 2 & 1 &)8 \\ + & & 2 & 3 & 5 & \\ \hline & & & & 3 & \end{array}$$

Method 2

$$\begin{array}{ccccl} 1 & 3 & 4 & 7 & \\ & & 2 & 1 & \\ & 2 & 3 & 5 &)6 \\ \hline & & & 3 & \end{array}$$

Ask, "How do I regroup 13 ones?" Elicit the response, 13 ones can be expressed as 3 ones and 1 ten. Enter the one ten at the top of the ten's place. "Add the tens." Elicit that there are 10 tens. "How can I regroup ten tens?" Elicit the response, as one hundred and 0 tens. Enter "0" under the tens' place and write the one at the top of the hundreds column. "Add the hundreds." Elicit the response, 6 hundreds. Write the 6 under the hundreds' place. "Add the thousands." Elicit the response, one thousand. Enter a "1" under the thousands place. Label the answer "sum." Reinforce that in addition we can reverse the order of the addends. "We can check by adding the 5 and 1 first, in the ones column, then the 7. "We can do the same for the tens, hundreds and thousands."

Repeat this procedure with the following examples, e.g., 1,346 + 21 + 663; 3,071 + 12 + 59.

4.02.01.02 **rewrite a horizontal algorithm in correct vertical format and check**

4.02.01

STRATEGY 1: Ask a student to read from a chart. "There are 2,163 boys and 1,435 girls in school. How many students are in school? How can I find the number of students?" Elicit the response, we will add.

Write the following on the chalkboard.
e.g., thousands, hundreds, tens and ones.
2,163 + 1,435 = ____.
Say, "How many ones are in the number 2,163?" (3.)
"How many ones are in the number 1,435?" (5.)
"Let's add the ones. How much is 3 plus 5?"
(Eight.)
Write the following on the chalkboard.
2,163 + 1,435 =_ _ _ 8
Ask a student to add the tens, another to add the hundreds and another to add the thousands. Write the following on the chalkboard. 2,163 + 1.435 = 3,598 sum.
Say, "We can work this example using a vertical format." Write the following on the chalkboard.
e.g.,

Thousands	Hundreds	Tens	Ones
2	1	6	3
+ 1	4	3	5

Say, "Let's check our sum." Ask a student to add ones, tens, hundreds and thousands. Check sum using horizontal format. Repeat this procedure for the following examples.
2,426 + 1,532 =_______
6,421 + 146 =_______.

STRATEGY 2: Show students play bills in denominations of thousands, hundreds, tens and ones.

Ask a student to read from a list, "Paper for our school cost $1,643 and books cost $2,125. What is the total cost?"

STRATEGY 2: cont'd

"How can we find total cost?" (Add.)
Ask four students to show with paper money, 1 thousand-dollar bill, 6 hundred, 4 tens and 3 ones. Each student has a different denomination. Write $1,643 on the chalkboard. Ask four other students to find $2,125. Write $2,125 on the chalkboard. "Write an equation to find the sum." e.g., $1,643 + $2,125 = _____.
Ask the students holding the dollar bills, "How many one dollar bills are there?" Elicit the response, 3 + 5 = 8. Write on the chalkboard, $1,643 + $2,125 = _ _ _ 8. "We can check our sum by writing this equation in vertical format."

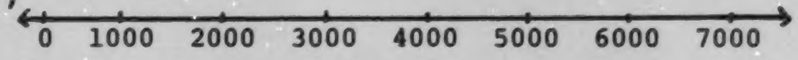
e.g.,	Thousands	Hundreds	Tens	Ones
	$ 1	6	4	3
	+ 2	1	2	5

Ask students to come to show sum for each place. Check using horizontal form. Repeat this procedure for the following examples, $3,271 + 1,418 = _______, $5,617 + 321 = ________.

4.02.01.03 **estimate sums by rounding addends to the largest place**

STRATEGY 1: Show a number line on the chalkboard.

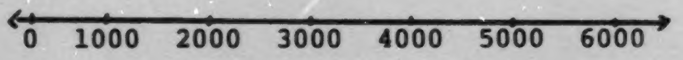
e.g.,



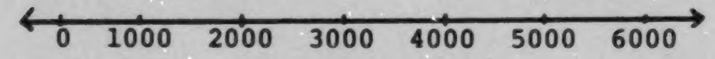
Say, "Jerry's uncle bought 2 used vans for his business. One cost $4,891 and another cost $3,215. Estimate the cost of each. Estimate the total."

STRATEGY 1:
cont'd

Ask a student to come to the number line to find $4,891.



"Is the number closer to 4000 or 5000?" Elicit the response, it is closer to 5000. Ask another student to come to the numberline to find 3,215.



"What number is 3,215 closer to?" Elicit the response, it is closer to 3000.
Say, "Let's find the sum of 5000 and 3000." Add the following example on the chalkboard.

$5,000
+3,000
$8,000

"Let's see how close our estimate is. Add."

$4,891
+3,215
$8,106

"How many thousands is $8,106 close to?" (8000.)
Say, "Our estimate is close to the total sum."
Repeat this procedure for the following examples:

6,921 + 4,816 = _____. 8,121 + 1,032 = _____.

STRATEGY 2: Show students paper money in thousand dollar denominations.

Say, "A stereo cost $1,145. A car cost $7,815. Estimate the cost of each. Estimate the total cost."

STRATEGY 2: cont'd

Show students $1000 and $2000. "Which is $1,145 closer to? Will I be spending about $1000 or $2000?" ($1000.)
"What is $7,815 closer to?" Show 7 thousand dollar bills and 8 thousand dollar bills. Elicit the response, this is almost $8000.
Write the following on the chalkboard.
e.g.,

$7,815	8000
+1,145	+1000

"Find the sums."

Actual	Estimate
$7,815	$8,000
+1,145	+1,000
$8,960	$9,000

Ask, "What is $8,960 closer to?" (9000.) "Our estimate is close to the sum."
Repeat this procedure for the following examples.

$2,815 + $2,135 = _____. $6,715 + 3,241 = _____.

4.02.01.04 to solve word problems related to skills learned in this module

STRATEGY 1: Ask a student to read, "At the parade there were 1,425 marchers, 1,231 people playing in bands and 143 flag bearers. How many people were at the parade?" "How can we find the total number of people?" Elicit the response, we will add.

STRATEGY 1: cont'd

Write the following on the chalkboard.
e.g., Thousands Hundreds Tens Ones
Ask a student to write under each place the numerals 1,425. Ask another student to write 1,231 on the chalkboard. Then ask a third student to write 143.

Thousands	Hundreds	Tens	Ones
1	4	2	5
1	2	3	1
1	7	4	3

"Find the sum."

$$\begin{array}{r} 1,425 \\ 1,231 \\ \underline{1,743} \\ 4,399 \end{array}$$

Say, "Let's estimate the sum to the nearest thousand."
"1,425 closer to?" (One thousand.)
"1,231 closer to?" (One thousand.)
"1,743 closer to?" (Two thousand.)
"Our estimate is 1000 + 1000 + 2000. The sum 4,399 rounded to the nearest thousand is?" (4000.)

Repeat this procedure using the following examples.

1. 2,431 people were watching the parade from the street, 183 were at the grandstand, 1,821 were marching. How many people were at the parade?
2. At the parade 1,742 were watching, 423 were marching, 68 people were selling things. How many people were there?

STRATEGY 2: Say, "Write any 4-place number to describe the number of pencils, books and papers in the supply room."

List the numbers on the chalkboard. "Use these numbers to write a story problem." Ask a student to read his story. e.g., The supply room of P.S. 124 has 1,200 pencils, 2,899 books and 9,750 sheets of paper. Estimate to the nearest thousands, the sum of pencils, books and sheets of paper. What is the actual sum of the three items? Say, "Estimate the sum, and then find the actual sum."

Repeat this procedure using other story problems made up by other students.

P.O. 4.02.01.01

NAME:______________________ CLASS:__________ DATE:________

Directions: Find the sums. Check by adding up. Find the answers in the answer box by reading horizontally or vertically. Circle the answer.

1.
423
124
235
782

2.
7028
131
43

3.
321
134
643
132

4.
6384
1230
65
438

5.
2386
145
723
1364

6.
3816
2391
146
283

7.
2835
176
1204
390

8.
3342
2127
641
302

Answer Box

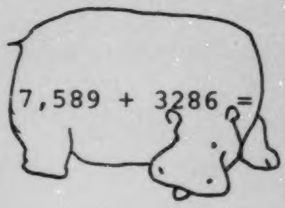
6	3	4	7	8	3
4	7	8	2	6	6
1	9	1	0	6	5
2	4	1	2	3	0
9	1	7	9	6	3
3	4	6	1	8	2
5	4	6	0	5	9

P.O. 4.02.01.02

NAME:____ **CLASS:**_________ **DATE:**________

Directions: Here is a game called "Four Across." First rewrite the problem. Then add. In one row all 4 answers are the same. Find the row that has "Four Across."

FOUR ACROSS

4,138 + 3,017 = 4138 + 3017 7155	6,037 + 8,296 =	4,263 + 432 =	7,589 + 3286 = 
9,326 + 8,143 =	5,091 + 6,028 =	7,056 + 123 =	3,264 + 1,862 =
7,291 + 123 =	5,312 + 2102 =	4,283 + 3,131 =	5,370 + 2044 =
5,321 + 422 =	4,094 + 6,728 =	8,791 + 103 =	7,056 + 123 =

P.O. 4.02.01.03

NAME: ________________ CLASS: ________ DATE: ______

1. Round to the nearest thousand.
2. Round each number, find the sum. Compare the actual sum.

① 5,321 rounds to 5,000	5,671 rounds to ________	5,551 rounds to ________	4,321 rounds to ________
3,999 rounds to ________	3,001 rounds to ________	7,328 rounds to ________	6,235 rounds to ________

②

4,321 rounds to 4,000
+1,892 rounds to +2,000
6,213 6,000

Actual Sum Rounded Sum

3,471 rounds to
+1,912 rounds to + ________

Actual Sum Rounded Sum

8,451 rounds to
+4,913 rounds to + ________

Actual Sum Rounded Sum

6,251 rounds to
1,393 rounds to + ________

Actual Sum Rounded Sum

6,471 rounds to
+8,998 rounds to + ________

Actual Sum Rounded Sum

5,651 rounds to
+2,131 rounds to + ________

Actual Sum Rounded Sum

P.O. 4.02.01.03 (cont'd)

NAME: ______________________ CLASS: ________ DATE: ________

Round each number, find the sum. Compare the actual sum.

7,251 rounds to +3,179 rounds to + ________ Actual Sum Rounded Sum	6,971 rounds to +4,898 rounds to + ________ Actual Sum Rounded Sum
8,329 rounds to +4,912 rounds to + ________ Actual Sum Rounded Sum	6,021 rounds to +3,941 rounds to + ________ Actual Rounded Sum
4,938 rounds to +3,452 rounds to + ________ Actual Sum Rounded Sum	5,341 rounds to +2,566 rounds to + ________ Actual Sum Rounded Sum
6,462 rounds to +4,562 rounds to + ________ Actual Sum Rounded Sum	3,246 rounds to +4,821 rounds to + ________ Actual Sum Rounded Sum

P.O. 4.02.01.04

NAME: ______________________ CLASS: ________ DATE: ________

1. Find the sum.
2. Solve the word problems.

1

(a) 8 + 5 = 13

(b) 9 + 6 =

(c) 7 + 4 =

(d) 8 + 9 =

2.

(a) 1,312 people were at the game. 321 more people came. Then another 34 came. How many people were at the game? 1,667

```
1,312
  321
   34
-----
1,667
```

(b) 4,321 pencils were in an order. We ordered 432 more last week and 35 more this week. Now there are ________ pencils in order.

(c) 2,421 lollipops were in a box. 1,134 candy canes were in a box 342 mints were in another box. HOw many candies were there? ____________

(d) There were 1,215 red candies, 8,715 yellow candies, 1,213 pink candies. How many candies were there?

____

(e) At the festival, 4,028 people arrived at 11 AM; 1,378 people at 1 PM; 3,913 people arrived at 3 PM. How many people were at the festival?

____

(f) A blouse cost $7.98, shoes cost $12.98, sock cost $.75. Find the total cost. ____________

P.O. 4.02.01.04 (cont'd)

NAME:______________________________ CLASS:__________ DATE:________

Solve the word problems

g) A blouse cost $7.98
shoes cost $12.98
sock cost $.75
Find the total cost.

h) Monopoly cost $10.98
Scrabble cost $11.75
Concentration cost $12.50
Find the total cost.

i) Janice saved $5.25 in her bank. Her aunt gave her $12.00 for her birthday. Her grandmother gave her $15.00. How much money does Janet have?

j)

Flavor	Amount sold
Vanilla	1,234
Cherry	3,135
Chocolate	6,791

This chart shows the amount of ice cream that was sold by a Carvel store last week. Find the total amount of ice-cream sold.

Unit 11

4.14.04 REVIEW - SUBTRACTION

(ongoing)

PERFORMANCE OBJECTIVES

The student will be able to...

4.14.04.01 compute differences of 2- and 3-digit numbers without regrouping;

e.g.,

$$\begin{array}{r} 78 \\ -43 \\ \hline 35 \end{array} \qquad \begin{array}{r} 975 \\ -362 \\ \hline 613 \end{array}$$

4.14.04.02 compute differences of 2- and 3-digit numbers with regrouping.

e.g.,

$$\begin{array}{r} \overset{8}{\cancel{9}}\overset{14}{\cancel{4}} \\ -27 \\ \hline 67 \end{array} \qquad \begin{array}{r} 8\overset{8}{\cancel{9}}\overset{11}{1} \\ -256 \\ \hline 635 \end{array}$$

4.14.04

VOCABULARY

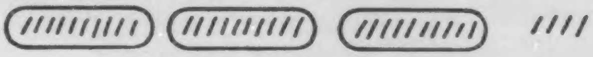
TERMS

difference
regroup
digit

GETTING STARTED

Distribute 3 single digit number cards to students. Display a flashcard for subtraction facts, or write a subtraction fact on the chalkboard. Ask, "What does 7-5=   ?" Elicit that it is 2. Say, "If you have a card with the number 2 on it, place it on your desk." Repeat this procedure until a student has used all three of his cards. He is the "winner."

Show students sets of straws bundled in tens, and some single straws.



Ask, "How many straws are there?" Elicit that there are 34. Ask, "How many groups of tens are there?" Elicit that there are 3. Ask, "How many ones are there?" Elicit that there are 4. Write the answers on the chalkboard.
e.g.,

Tens	Ones
3	4

Show students a 1 bundle of one hundred straws, 2 bundles of tens and 3 straws. Ask, "How many straws are there?" Elicit that there are 123. Ask, "How many hundred bundles are there?" Elicit that there is 1. Ask, "How many tens bundles?" Elicit that there are 2. Ask, "How many ones?" Elicit that there are 3. Write the following on the chalkboard.
e.g.,

Hundreds	Tens	Ones
1	2	3

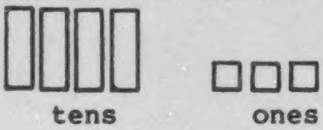
Repeat this procedure for 106, 160.

4.14.04

4.14.04.01 **compute differences of 2 and 3 digit numbers without exchange**

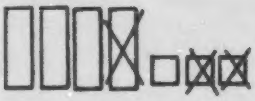
STRATEGY 1; Show 4 tens and 3 ones using felt back square material on felt board.

e.g.,



Say, "How much is this?" (43.) Write 43 on the chalkboard. "43 students are in the gym; 12 students leave the gym to go to the library. How many students are left?" Ask a student to write the number 12 on the chalkboard under the 43. "How many ones are in the number 12?" Elicit that there are 2 ones. Ask a student to come to the felt board to remove 2 ones. Follow the same procedure at the chalkboard.

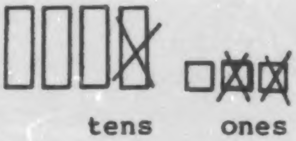
e.g.,



	tens	ones
	4	3
-	1	2
		1

"How many ones are left?" (1.) Ask a student to come to the felt board to remove 1 ten. Do the same at the chalkboard. "How many tens are left?" (3.)

e.g.,



	tens	ones
	4	3
-	1	2
	3	1

"What number does the feltboard represent?" (31.) "What is the number at the chalkboard?" (31.) "31 is the difference between 43 and 12."

4.14.04

STRATEGY 1: cont'd

Repeat this procedure for using the following examples.

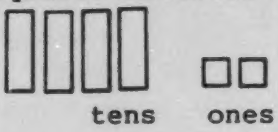
$$\begin{array}{r} 57 \\ -\ \underline{23} \end{array} \qquad \begin{array}{r} 135 \\ -\ \underline{\ 14} \end{array} \qquad \begin{array}{r} 176 \\ -\ \underline{123} \end{array}$$ (use hundred squares at feltboard)

4.14.04.02 **compute differences of 2-and 3-digit numbers with exchange**

STRATEGY 1: Say, "42 books were on shelves. 23 books were taken by students to read at home. How many books are left?"

Distribute squared material to groups of students. "Use the squared material to show 42."

e.g.,



Ask a student to write 42 on chalkboard under the following headings.

tens	ones
4	2

"How many books were taken out?" (23.)

Ask a student to write 23 under the 42.

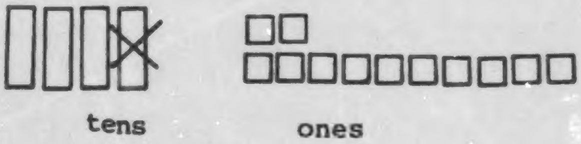
e.g.,

$$\begin{array}{rcc} & \text{tens} & \text{ones} \\ & 4 & 2 \\ - & \underline{2} & \underline{3} \end{array}$$

"How can I take 3 ones from 2 ones?" Elicit the response, we regroup ten as ten ones.

Show this using the squared material.

e.g.,



STRATEGY 1: cont'd

"How many ones are there now?" (12.) Show the following on the chalkboard.

$$\begin{array}{rcc} & \text{tens} & \text{ones} \\ & 3 & 12 \\ & \cancel{4} & \cancel{2} \\ - & \underline{2} & \underline{3} \end{array}$$

Ask students to take out 3 ones. Say, "How many ones are left?" (9.) "Take out 2 tens. How many tens are left?" (1.) "1 ten and 9 ones are left." Show the following on the chalkboard.

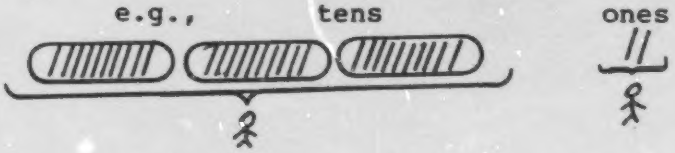
$$\begin{array}{rcc} & \text{tens} & \text{ones} \\ & 3 & 12 \\ & \cancel{4} & \cancel{2} \\ - & \underline{2} & \underline{3} \\ & 1 & 9 \end{array}$$

Repeat this procedure for the following examples.

$$\begin{array}{r} 41 \\ -\ \underline{26} \end{array} \qquad \begin{array}{r} 135 \\ -\ \underline{81} \end{array} \qquad \begin{array}{r} 225 \\ -\ \underline{169} \end{array}$$

STRATEGY 2: Show bundles of straws totaling 32.

e.g.,



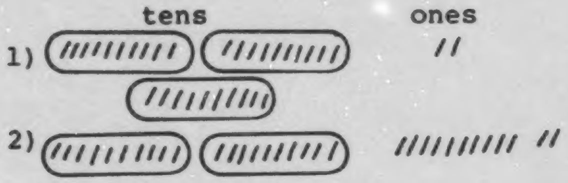
Ask, "How many straws are there?" (32.) "How many tens?" (3 tens.) "How many ones?" (2 ones.) "What number is this?" (32.) Write the following on the chalkboard.

tens	ones
3	2

STRATEGY 2: cont'd

Say, "We need 15 straws for the lunch table. How many ones are in the number 15?" (5.) "How can we take out 5 ones if we only have 2?" Elicit the response, "We will regroup one of the tens for ten ones."

Demonstrate using the straws.
e.g.,



Write the following on the chalkboard.

$$\begin{array}{rcc} & \text{tens} & \text{ones}\\ & 2 & 12\\ & \cancel{3} & \cancel{2}\\ - & \underline{1} & \underline{5}\end{array}$$

"Take out 5 ones, 1 ten. How many straws are left?" (17.)

Repeat this procedure for the following examples.

$$\begin{array}{r} 51\\ -\ \underline{18}\end{array}\qquad\begin{array}{r} 132\\ \underline{-18}\end{array}\qquad\begin{array}{r} 243\\ -\ \underline{161}\end{array}\qquad\begin{array}{r} 342\\ -\ \underline{188}\end{array}$$

P.O. 4.14.04.01

NAME: ______________________ CLASS: __________ DATE: ________

Directions: Break the code and answer the question.

What did the floor say to the wall?

R
84
-32
52

M
95
-41

Y
84
-14

O
136
-23

E
421
-111

T
835
-110

U
796
-344

A
892
-111

H
776
-144

N
944
-100

C
406
-103

54 310 310 725   70 113 452   781 725

					R			R.
725	632	310	303	113	52	844	310	52

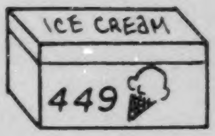
159

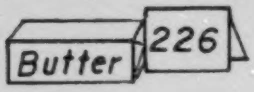
P.O. 4.14.04.02

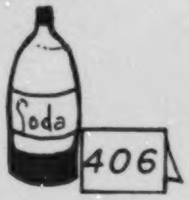
NAME: ______________________ CLASS: ________ DATE: _______

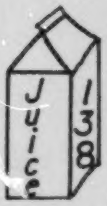
Directions: Solve the problems below. Draw a circle around each food that has a numeral that matches an answer. Which foods did you buy?

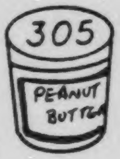
Lets Go Shopping!

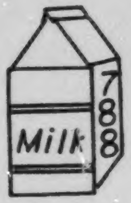

ICE CREAM
449

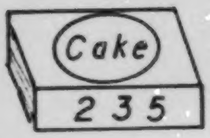


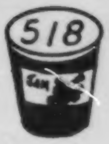


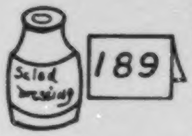


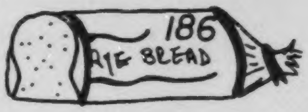

305
PEANUT BUTTER

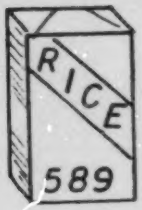


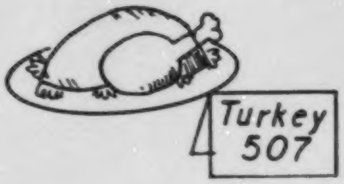





Salad Dressing
189


186
RYE BREAD





1) 481 - 246	2) 634 - 127	3) 393 - 167
4) 784 - 195	5) 896 - 176	6) 645 - 239
7) 732 - 283	8) 896 - 378	

4.03.01 SUBTRACTION OF 5-DIGIT NUMBERS WITH AND WITHOUT REGROUPING

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.03.01.01B subtract a 5-digit number from a 5-digit number with one regrouping (ten thousands to thousands);

e.g.,

$$\begin{array}{r} 86{,}972 \\ \underline{-59{,}851} \\ 27{,}121 \end{array}$$

4.03.01.02B subtract 1- ,2-, 3-, and 4-digit numbers from 4-digit numbers with zero in the ones place (with regrouping);

e.g.,

$$\begin{array}{r} 9{,}3\overset{4}{\cancel{5}}\overset{10}{\cancel{0}} \\ \underline{-\quad 6} \\ 9{,}344 \end{array} \qquad \begin{array}{r} 9{,}\overset{2}{\cancel{3}}\overset{14}{\cancel{5}}\overset{10}{\cancel{0}} \\ \underline{-\quad 86} \\ 9{,}264 \end{array}$$

$$\begin{array}{r} \overset{8}{\cancel{9}}{,}\overset{12}{\cancel{3}}\overset{14}{\cancel{5}}\overset{10}{\cancel{0}} \\ \underline{-\quad 786} \\ 8{,}564 \end{array} \qquad \begin{array}{r} \overset{8}{\cancel{9}}{,}\overset{12}{\cancel{3}}\overset{14}{\cancel{5}}\overset{10}{\cancel{0}} \\ \underline{-4{,}786} \\ 4{,}564 \end{array}$$

4.03.01.03B estimate differences by rounding minuends and subtrahends (less than 100,000) to the nearest 1,000 and 10,000;

e.g.,

To the nearest thousand

$$\begin{array}{rcr} 9{,}246 & \text{rounds to} & 9{,}000 \\ \underline{-3{,}125} & \text{rounds to} & \underline{-3{,}000} \\ 6{,}121 & & 6{,}000 \end{array}$$

To the nearest ten thousand

43,758	rounds to	44,000
-21,256	rounds to	-21,000
22,502		23,000

4.03.01.04B solve word problems related to skills learned in this module.

e.g.,

> There were 34,283 people at the automobile show during the first week and 13,142 people during the second week. How many more people attended the first week? Estimate by rounding to the nearest ten thousand to find the difference.

To the nearest ten thousand

34,283	rounds to	30,000
-13,142	rounds to	-10,000
21,145		20,000

4.03.01

VOCABULARY

TERMS

place value
regroup
minuend
subtrahend
difference

GETTING STARTED

Write the number, 79,358, and a 5 place "Place Value Chart" on chalkboard.

Ask students to name the columns and write the names in the correct places on the chart. Ask the students to place the number in the place value chart.

e.g.,

ten thousands	thousands	hundreds	tens	ones
7	9	3	5	8

Write 26,243 and have students place the number on the chart. Ask students to subtract. "Where do you start?" Right side, ones column. "What comes next?" Tens...

Ask each time, "Do you have enough to take away? Do you need to regroup?" (No) Say, "When we have enough, we subtract and move from right to left."

Write on the chalkboard the following example.

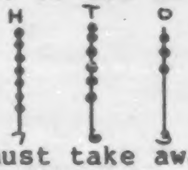
e.g.,

$$\begin{array}{r} \underline{\text{HTO}} \\ 763 \\ \underline{-458} \\ 305 \end{array}$$

GETTING STARTED cont'd

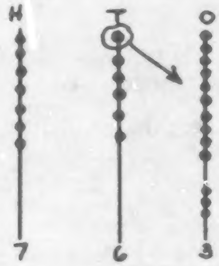
Ask students to use an abacus to show 763.

e.g.,



Say, "You must take away 458. Let's start with the ones first. How many ones do we need to take off? (8) Do we have enough? (No, we only have three.) What must we do?" Elicit the response, "We must regroup one ten for 10 ones." Show on the abacus. Write the regrouping on the chalkboard.

e.g.,



"How many tens do we have now? (5) How many ones? (3 + 10 = 13) Take off 8. How many are left? (5) How many tens are needed? (5) Take them off. How many are left? (10) How many hundreds are needed? (4) How many are left? (3)" Write the answers under the example as they are said. Say, "When we subtract and we do not have enough, we must regroup. If we have enough, we just take away the stated amount."

Repeat this procedure using an abacus.

e.g.,

738 -154	634 -156
(regrouping hundreds as tens)	(regrouping hundreds and tens)

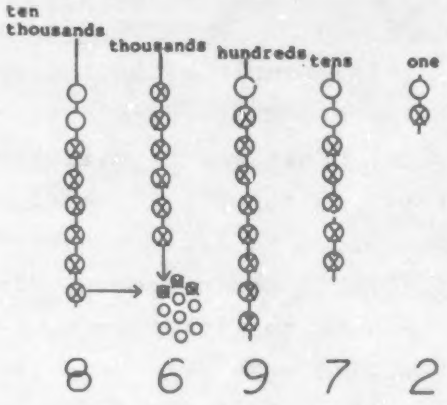
4.03.01

4.03.01.01 subtract 5-digit from a 5-digit number with one regrouping (ten thousands to thousands)

STRATEGY 1: Write the following on the chalkboard.

$$\begin{array}{r} 86{,}972 \\ -\ \underline{59{,}851} \end{array}$$

Say, "Let's use an abacus to do this subtraction example. Put 86,972 on the abacus and name the strings." Demonstrate on the abacus.



Say, "We must now subtract 59,851. Name place value. Where do we start? (ones) Take away one. How many left? (1)" Write answer on board as students do movement on abacus. Say, "Remove 5 from the tens column. How many left? (2) Remove 8 from hundreds column. How many left? (1) How many thousands must we take away? (9) What is the problem?" Elicit the response, we only have 6. "What must we do? We must regroup. We will exchange one ten thousand for 10 one thousands." Show exchange on abacus and write on example.

e.g.,

$$\begin{array}{rr} 7 & 16 \\ \cancel{8} & \cancel{6},\ 972 \\ -\ \underline{5} & \underline{9,\ 851} \\ 2 & 7,\ 121 \end{array}$$

STRATEGY 1: cont'd

Say, "How many ten thousands do we have after the exchange? (7) How many thousands do we have? (16) Take away 9 thousands. How many left? (7) Takeaway 5 ten thousands. How many left? (2.) Read number shown on abacus and on chalkboard.

Repeat procedure using the abacus and chalkboard for the following example:

$$\begin{array}{r} 72{,}873 \\ -\ \underline{58{,}321} \end{array}$$

STRATEGY 2: Write the following example on the chalkboard.

$$\begin{array}{r} 86{,}972 \\ -\ \underline{59{,}851} \end{array}$$

Say, "Let's try this example without using any materials for helpers. Where do we start? (ones column, right side) What is the difference? (1) How much is 7 tens - 5 tens? (2) What column goes next? (hundreds column to left) Answer? (1) How much is 6 - 9?" Elicit the response, "That it can't be done. Six is smaller than 9. Hold up 6 fingers. Can you give away 9?" (No, impossible.) "What should we do?" Elicit the response, "Make an exchange. Regroup. Change the 8 to 7 and the 6 to 16." Explain to students, "We are not just doing magic and rewriting and crossing out numbers. We are exchanging one ten thousand for 10 one thousands. When we take the one ten thousand from the 8 we have 7 ten thousands left. When we add the 10 one thousands to the 6 we have 16 one thousands. Write regrouping above example."

e.g.,

$$\begin{array}{rrr} & 7 & 16 \\ & \cancel{8} & \cancel{6},\ 972 \\ - & \underline{5} & \underline{9,\ 851} \\ & 2 & 7,\ 121 \end{array}$$

"Now let's continue." 16 - 9 = (7); 7 - 5 = (2). "Read your answer." (27,121) "Check your answer using addition."

4.03.01

4.03.01.02 **subtract 1-, 2-, 3-and 4- digit numbers with zero in the ones place (with regrouping)**

STRATEGY 1: Ask students to use abacus to find solution to the following example.

$$\begin{array}{r} 9350 \\ -\quad 6 \\ \hline ? \end{array}$$

Say, "How many ones do you have?" (0) "How many must you take away?" (6) "What must you do?" Elicit the response, "Exchange one ten for 10 ones. How many ones do you have now?" (10) "How many tens?" (4) "Take away 6 ones. What is the answer?" (Read left to right, 9 thousands, 3 hundreds, 4 tens, 4 ones.) "What number is that?" (9,344)

"Now try this using the abacus to solve the following example."

$$\begin{array}{r} 9350 \\ \underline{-\ 86} \end{array}$$

"You already know how to exchange one ten for 10 ones. Let's do that again and take away 6 ones. How many ones are left?" (4) "How many tens do you have?" (4) "Can you take off 8?" (No) "What must you do?" Elicit the response, "Exchange one hundred for 10 tens." "Do it. How many tens do you have now?" (14) "How many hundreds?" (2) "Take away 8 tens. How many left?" (6) "What is the answer on the abacus?" Read left to right, 9 thousands, 2 hundreds, 6 tens, 4 ones. "What number is that?" (9264)

Repeat this procedure using the abacus to solve the following examples.

$$\begin{array}{r} 9350 \\ \underline{-786} \end{array} \qquad \begin{array}{r} 9350 \\ -\ \underline{4786} \end{array}$$

Introduce new exchange of one thousand for 10 hundreds.

4.03.01

STRATEGY 2: Write the following examples on the chalkboard.

$$\begin{array}{r} 9350 \\ \underline{-\quad 6} \end{array} \qquad \begin{array}{r} 9350 \\ \underline{-\ 86} \end{array} \qquad \begin{array}{r} 9350 \\ \underline{-786} \end{array} \qquad \begin{array}{r} 9350 \\ -\ \underline{4786} \end{array}$$

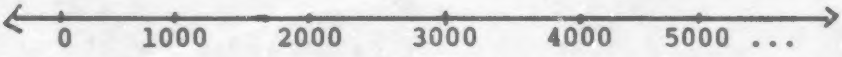
Ask, "What do you notice is the same in each example?" Elicit the response, the top number is 9350. Number on bottom increases one digit for each example. "Do you think doing the first example will help in solving the next? Let's try it."

"What exchange was made in the first example?" Elicit the response, "One ten was exchanged for 10 ones." Ask student to do example on chalkboard. "Do the next example. What exchange was made?" Elicit the response, one ten for 10 ones, one hundred for 10 tens. Demonstrate on the chalkboard. "What regrouping was done?" (one ten for 10 ones, one hundred for 10 tens, one thousand for 10 hundreds)

Repeat the same procedure to complete the other examples.

4.03.01.03 **estimate differences by rounding minuends and subtrahends (less than 100,000) to nearest 1,000 and 10,000 thousand**

STRATEGY 1: Write number line on chalkboard (marked in thousands).



STRATEGY 1: cont'd

Ask, "What is the midpoint between 0 and 1000? (500); 1000 - 2000? (1500); 3000 - 4000 (3500); 5000 - 6000? (5500). Show on line. "What is the number we use as a guide in rounding off to the nearest thousand?" (500) "What should we do if the hundreds number is from 0-499, such as 2346, 4136, 5489?" Elicit the response, round down. "What should we do if the hundreds number is above 500?" Elicit the response, go to next thousand and round up. Show on number line. Write on chalkboard: below 500, round down; above 500, round up. "Let's use this rule to round off and estimate subtraction examples." Write the following on the chalkboard.

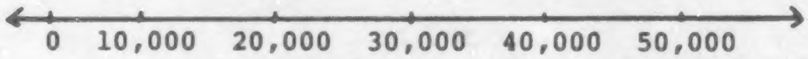
$$\begin{array}{r} 9{,}246 \\ -\ \underline{3{,}125} \end{array}$$

Say, "9,246, rounds up or down?" (down) "To what number?" (9000) "3,125 rounds up or down?" (down) "To what number?" (3000) "Think, 9000 - 3000 = ?" (6000) "All rounding and estimating is done mentally. Now let's use a pencil and do the actual example and compare it with the estimated difference of 6000."

Write on the chalkboard. Round, estimate, and work out the following examples.

$$\begin{array}{r} 9{,}856 \\ -\ \underline{1{,}234} \end{array} \qquad \begin{array}{r} 7{,}538 \\ -\ \underline{2{,}326} \end{array} \qquad \begin{array}{r} 8{,}241 \\ -\ \underline{2{,}673} \end{array}$$

STRATEGY 2: Write number line on chalkboard, mark in ten thousands.



Ask, "What is the midpoint between 0 - 10,000? (5000); 20,000 - 30,000? (25,000); 40,000 - 50,000? (45,000)" Show on number line. "How can we round

STRATEGY 2:
cont'd

off to the nearest ten thousand, 12,356? (10,000); 56,374? (60,000); 43,768? (40,000)." Show each on number line. "What is the rule?" Elicit the response, "If the one thousand digit is 0,1,2,3,4 drop it, round down to nearest 10,000. If the digit is 5 or above, go to next highest 10,000. Round up." Write the rule on the chalkboard.

Below 5000 - round down
Above 5000 - round up

Say, "Let's use the rule to round off and estimate." Write on the chalkboard.

$$\begin{array}{rrr} & 47,758 \text{ rounds to} & 50,000 \\ - & \underline{21,256} \text{ rounds to} & \underline{20,000} \\ & & 30,000 \end{array}$$

"47,759 rounds up or down?" Elicit the response, round up, 7000 is greater than 5000. Write 50,000, the rounded number next to example. Say, "21,156 rounds up or down?" Elicit the response, 1,000 is less than 5,000, so we round down. Write 20,000 the rounded number next to example. "What is the estimate answer?" (30,000) Write estimated answer. Ask students to do actual example and compare with estimated answer.

Write on the chalkboard: Round, Estimate, Compare.

$$\begin{array}{rrrrrr} & 56,374 & & 82,358 & & 92,345 \\ - & \underline{24,275} & - & \underline{38,756} & - & \underline{29,763} \end{array}$$

4.03.01.04 **solve word problems related to skills learned in this module**

STRATEGY 1: Say, "There were 34,283 people at the automobile show during the first week and 13,142 people during the second week. How many more people attended the first week? What kind of problem is this?" Elicit the response, subtraction, we're comparing two weeks attendance. We are going to estimate the difference by rounding to the nearest ten thousand. "I will reread the problem and you will round the number, 34,283. Do we round up or down? (down) What is the number?" (30,000) Repeat procedure with 13,142.

Reinforce procedure using different numbers for first and second day.

e.g.,

first day	63,426	29,372	35,372
second day	38,598	24,736	29,738

P.O. 4.03.01.01

NAME:____________________CLASS:________DATE:_______

Subtract. Check with addition.

26,158 -13,234 check	98,428 -24,263 check
93,592 -71,586 check	54,875 -28,341 check

P.O. 4.03.01.02

NAME: ______________________ CLASS: __________ DATE: ________

Subtract and check.

69,350 - 6	69,350 - 86	69,350 - 786	69,350 -4,786
69,350 -34,786	42,310 - 984	53,440 -5,797	63,630 -4,774
24,680 - 7	24,680 - 87	24,680 - 947	24,680 -13,394
13,770 -6,481	25,110 -12,243	82,610 - 611	94,440 -16,083

P.O. 4.03.01.03

NAME:______________________ CLASS:________ DATE:_______

I.

Circle the best estimate.

5,326 - 1,254 = 400 [✓ 4,000] 3,000

9,251 - 2,937 = 7,000 6,000 600

26,374
-13,572

20,000
2,000
10,000

58,009
-37,562

10,000
20,000
2,000

82,475
-27,352

60,000
5,000
50,000

II.

Round off to the nearest 1,000, estimate, and compare.

9,246 rounds to
-3,125 rounds to
6,121

5,946 rounds to
-1,253 rounds to
6,000

III.

Round off to the nearest 10,000. Estimate and compare.

26,372 rounds to
-12,157 rounds to
rounds to

48,375 rounds to
-26,590 rounds to
rounds to

93,751 rounds to
-34,127 rounds to
rounds to

57,328 rounds to
-24,372 rounds to
rounds to

P.O. 4.03.01.04

NAME:______________________________CLASS:_________DATE:_______

Complete the chart
Read the problem. Estimate by rounding. Solve.

Chart of Estimated Inventory

	BOUGHT	SOLD	LEFT
Toys	6,357 round off (6,000)	1,938 round off (2,000)	4,000
Puzzles	3,878 round off ( )	1,258 round off (1,000)	estimate
Books	8,963 round off (9,000)	5,738 round off ( )	estimate
Cards	5,279 round off ( )	4,276 round off ( )	estimate

Read the Problem. Estimate by rounding. Solve.

I had $56,245. I spent $23,274. How much is left?
Estimate_________ Solution________

9,356 boys. 2,842 girls. How many more boys than girls?
Estimate_________ Solution________

46,275 tickets sold yesterday, 74,352 tickets sold today. How many more today?
Estimate_________ Solution________

4.13.03 PROBLEM SOLVING - USE NUMBER SENTENCES TO SOLVE PROBLEMS

(2-3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.13.03.01A translate a one step story problem into a number sentence;

e.g.,

John is 160 cm tall. His friend is 148 cm tall. How much taller is John than his friend?

160 cm - 148 cm = ?

4.13.03.02A choose and sequence operations to solve a two step story problem;

e.g.,

Sam baked three pans of cookies. There were 18 cookies in each pan. Sam sold 10 cookies to Bob. How many cookies did Sam have left?

First Step: Find the total number of cookies?

Second Step: Now use that information to find the number of cookies that are left.

4.13.03.03A create a story problem based upon a solution.

e.g.,

15 cm long

Suggestion: Melvin bought a piece of wood that was 99 cm long. He need 84 cm for the shelf in his bookcase. How much wood did Melvin have left after he made his shelf?

4.13.03

VOCABULARY

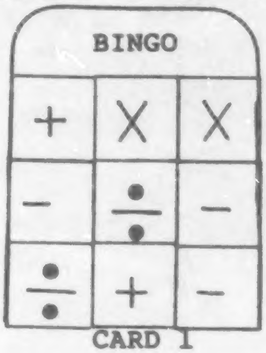
TERMS

operations
number sentence

GETTING STARTED

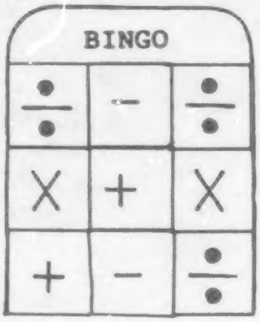
Divide the class into four teams. Provide each team with markers. Make four large Bingo cards. Instead of placing numbers in the boxes, place symbols for the four operations. The four cards should have a different arrangement of symbols.

e.g.,



BINGO		
+	X	X
−	÷	−
÷	+	−

CARD 1



BINGO		
÷	−	÷
X	+	X
+	−	÷

CARD 2

Read a series of one step word problems to the students. The students must figure out the operation needed to solve the problem. A member of the team then places a marker on the symbol for the operation. The students can only cover one symbol at a time. The team that covers three symbols in a row, vertically, horizontally or diagonally, says, "Bingo." That team wins the game.

Write the following word problem on the chalkboard.

> Susan bought a shirt for $5.95.
> She gave the clerk a 10-dollar bill.
> How much change did she receive?

GETTING STARTED cont'd

Say to students, "We must pick out the important information. One way to do this is to omit the words that are not needed to solve the problem. Underline all the words that are not necessary to solve the problem."

e.g., Susan bought a shirt for $5.95.
She gave the clerk a 10-dollar bill.
How much change did he give her?

Prepare a rexograph sheet with the following problems. Ask students to underline the words that are not necessary to solve the problem.

1. To build a treehouse, Pat cut a piece of wood into three pieces. One piece was 13 meters, the second was 14 meters and the third was 12 meters. How long was the original piece of wood?

2. Barbara bought a book for $2.98. She gave the clerk a five-dollar bill. How much change should she get?

3. Bob bought a can of juice for $.59, a cookie for $.25, and a pear for $.30. What was his total bill?

4. At breakfast, a family drank one liter of orange juice and 2 liters of milk. How much liquid did the family drink?

4.13.03

4.13.03.01 Translate a one-step story problem into a number sentence

STRATEGY 1: Place the following word problem on the chalkboard.

There were 23 circus posters on one wall.
There were 10 posters on another wall.
How many posters were there in all?

Say, "There are four steps in solving word problems. They are: read, plan, solve and check. After reading the problem we should underline all the necessary information." Ask a student to come to the chalkboard and underline the necessary information.

e.g.,

23 circus posters on one wall.
10 posters on another wall.
How many in all?

Say, "After reading the necessary information, decide on an operation to be used. What operation should we use for this word problem?" (Addition.) Ask, "Why did you choose addition?" Elicit the response, "We are putting things together to find a total, therefore, we add. We must write a number sentence from the information underlined." Ask students to write a number sentence. Ask a student to place the number sentence 23+10 = ? on the chalkboard. "Solve the number sentence. Check your answer. Always ask yourself if your answer makes sense."

Place three more word problems on the chalkboard. Repeat this procedure for writing a number sentence

STRATEGY 1: cont'd

with each word problem.

e.g.,

1. The circus traveled 1291 km in April and 479 km in May. How many kilometers did the circus travel?

2. One elephant weighs 4972 kg. Another elephant weighs 3198 kg. Find the difference.

3. The acrobats practiced 2 hours a day for 9 days. How many hours did they practice in all?

Ask the students to solve the problem and check to see that their answers make sense.

STRATEGY 2: Write four word problems on the chalkboard.

e.g.,

1. The acrobatic act was 25 minutes and the clown act was 37 minutes. How long were the two acts together?

2. The clowns spent $258 for makeup in May and $391 in June. How much more was spent in June?

3. Five boxes of popcorn cost $1.25. How much did each box cost?

4. One performance lasted 2 hours. How long did 3 performances last?

Say, "Read each problem, and identify the key words to help you decide what operation to use."

e.g.,

1. "together"
2. "how much more"
3. "did each cost"

Say, "Some word problems do not have key words and

STRATEGY 2: cont'd

we must use other methods like drawing a diagram or making a chart. Once we know what operation to use, we can write a number sentence." Ask the students to write a number sentence for the first problem. Elicit from the students 25+37 = ___. "Write number sentences for the rest of the problems." Ask students to place the number sentences on the chalkboard. "Solve the number sentences."

4.13.03.02 **choose correct sequence and operation to solve two step story problem**

STRATEGY 1:

Review the 4 steps in problem solving. Say, "The first step is to read the word problem and ask yourself, 'What is given?' or 'What is asked?' The 2nd step is to plan by asking yourself, 'What operations?' and to write a number sentence. The third step is to solve the problem by doing the arithmetic and writing the answer. The last step is to check to make sure the answer makes sense and that it answers the question."

Place the following word problem on the chalkboard.

> Oscar bought 2 bags of topsoil for $1.25 each and a plant for $2.75. How much money did he spend in all?"

Ask a student to underline the necessary information. The following should be underlined by the students.

2 bags topsoil $1.25 each
a plant for $2.75
how much in all?

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STRATEGY 1:
cont'd

Say, "How is this problem different from the other problems you have been solving?" Elicit the response that they have to do two steps before they can solve the problem.

"What must you do first?" Elicit the response, find the cost of the topsoil. Ask students to write a number sentence which describes finding the cost of the topsoil. Elicit the response, 2 x $1.25 = $2.50. "Have we answered the question?" Elicit the response, "No, we still have to add the cost of the plant. Write a number sentence for finding the cost of the topsoil and the plant." Elicit the response, $2.50 + $2.75. "Find the answer and check to see if the answer makes sense."

Repeat the same procedure using other examples of two-step word problems.

STRATEGY 2:

Place the following problem on the chalkboard.

> Sue bought 3 items costing $5.00 each. She gave the clerk a twenty dollar bill. How much change should she get?

Say, "After reading the problem you must decide on an operation. What is different about this problem?" Elicit from students that we must use more than one operation. "What operation must we use first?" (Multiplication.) "Write a number sentence to find the cost of 3 items." Elicit the response, "3 x $5.00 = ____."

"Will this equation alone help us answer the question in the problem?" Elicit the response, "No, we must write an equation to find out how much change Sue will get."

4.13.03

STRATEGY 2: cont'd

Ask students to write the number sentence to show how much change Sue will get back from $20. Elicit the number sentence $20.00 - $15.00 = ____.

Ask students to check their answers.

Repeat the procedure using other examples.

4.13.03.03 create a story problem based upon a solution

STRATEGY 1: Place certain information on the chalkboard.

e.g., 1. six boys and three girls
2. $10.00 minus $3.75
3. 16 + __ = 58

Ask students to think of a story problem using 6 boys and 3 girls. Place the student problems on the chalkboard.

e.g.,

Six boys were absent on Monday.
Three girls were absent on Tuesday.
How many students were absent both days?

Ask students to solve their story problems.

Say, "Create a story problem for number 2 on the chalkboard and solve it." Repeat the same procedure for number 3. "Make sure what you want the problem solver to find is very clear."

STRATEGY 2: Ask the students to bring in pictures from magazines and newspapers. "Create story problems from the pictures."

e.g.,

Show a picture of marchers in a parade drinking soda. Tell the story about marchers in a parade. "Fifty marchers were in a parade. Thirty marchers were thirsty and drinking soda. How many marchers did not drink soda?"

P.O. 4.13.03.01

NAME: ______________________________ CLASS: ________ DATE: ______

Write a number sentence for each problem.

1. Freddie's fantastic doughnut machine makes 9 donuts a minute. How many doughnuts can it make in 8 minutes?

   Number sentence 9 x 8 = ______.

2. Jerry picked 3 Kg of apples at the class picnic. Joey picked 4 Kg of apples. How many kilograms did they pick in all?

   Number sentence ________________.

3. Little Bo Peep had 14 sheep. She lost 6 of them. How many does she have left?

   Number sentence ________________.

4. Rocket Roberto is building a 4-stage rocket. It takes 2 weeks to build each stage. How many weeks will it take him to finish his rocket?

   Number sentence ________________.

5. Swiftly Sue can walk 60 blocks in a hour. Poky Pete can walk 40 blocks in an hour. How many more blocks can Sue walk in one hour?

   Number sentence ________________.

P.O. 4.13.03.02

NAME:____ CLASS:__________ DATE:________

Solve these problems. Show work in space provided.

1. Jim bought 8 pencils for $.12 each and 4 pens for $.49 each. How much did he pay in all?

   Work Space

   Answer: $2.92

2. Jo bought some paper for $1.49. She also bought a pen for $1.48. She gave the clerk a $5.00 bill. How much change should she receive?

   Work Space

   Answer:____________________________

3. Terry had $10.50. He spent $5.85. He then earned $7.75 more. How much does he have now?

   Work Space

   Answer:____________________________

4. On Saturday, Marty worked 8 hours at $7.00 per hour and 3 more hours at $10.50 per hour. How much did he earn?

   Work Space

   Answer:____________________________

4.13.03.02 (cont'd)
P.O.________

NAME:________________________________ CLASS:__________ DATE:________

Solve these problems. Show work in space provided.

5. Mr. Smith bought 2 shirts for $7.50 each and 4 ties for $4.50 each. How much did the shirt and ties cost?

Work Space

Answer:______________________________

6. Mary saved $50. for new tennis equipment. She saw a tennis racket for $12.95, nylon stringing for $12.95, a racket cover for $3.00, a racket frame for $4.50, and a can of balls for $2.29. If she bought this equipment, how much would she have left from $50.00?

Work Space

Answer:______________________________

7. Jan baked 36 cupcakes. She baked 11 chocolate and 8 vanilla cupcakes. She wanted to put strawberry icing on the cupcakes that were left. How many strawberry cupcakes did Jane have?

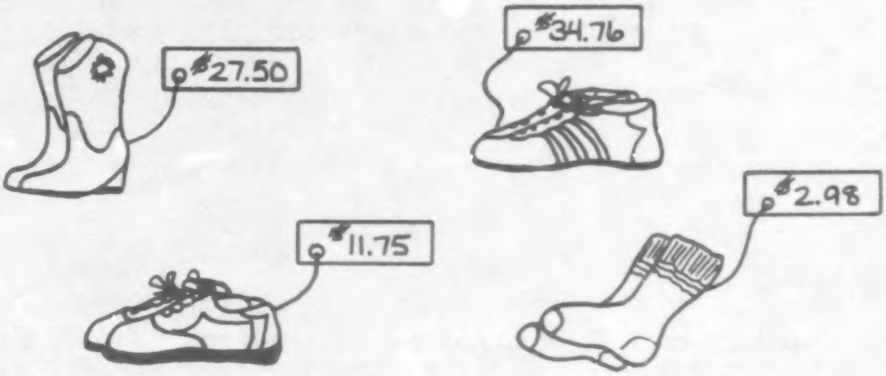
Work Space

Answer:______________________________

P.O. 4.13.03.03

NAME:______________________________ CLASS:________ DATE:________

Create your own story problems from the information given.
Write the problem in the space provided and solve them.



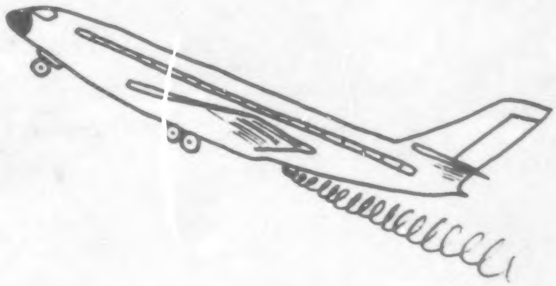
STORY PROBLEM	WORK SPACE	ANSWER
1. John bought a pair of shoes for $11.75. He gave the clerk a twenty dollar bill. How much change did the clerk give him?		$ 8.25
2. ________________________		$102.26
3. ________________________		$ 28.98

4.13.03.03 (cont'd)
P.O. ____________

NAME: ________________________ CLASS: __________ DATE: ________

Create your own story problems from the information given.
Write the problem in the space provided and solve them.

Planes	Speed in Miles per Hour
Fly Mobile	176
Wonder Jet	266
Rocket Ace	354
Space Flyer	561
Super Speeder	625



STORY PROBLEM	WORK SPACE	ANSWER
4. ____________________		Rocket Ace 88 miles per hour.
5. ____________________		442 miles per hour altogether.

4.14.05 REVIEW - MULTIPLICATION
(ongoing)

PERFORMANCE OBJECTIVES

The student will be able to...

4.14.05.01 compute basic multiplication facts through 9 x 9;
e.g.,

$$\begin{array}{r}4\\ \underline{x3}\\ 12\end{array} \quad \text{or} \quad 4 \times 3 = 12$$

4.14.05.02 multiply a 2- or 3-digit number by a 1-digit number with and without regrouping.
e.g.,

without regrouping	with regrouping
$\begin{array}{r}24\\ \underline{x2}\\ 48\end{array}$	$\begin{array}{r}346\\ \underline{x\ 2}\\ 692\end{array}$

4.14.05

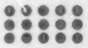
VOCABULARY

TERMS	SYMBOLS
multiplication	x
facts	
product	

GETTING STARTED

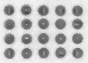
Distribute bead frames to students. Ask them to push aside 3 groups of five.

e.g.,



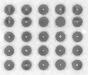
Say, "We have 3 fives. Ask, How many beads do we see?" Elicit that there are 15 beads. Write on the chalkboard, 3 x 5 = 15. Say, "Show another group of five."

e.g.,



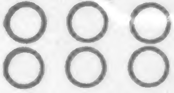
Say, "There are 4 fives. "How many beads are there?" Elicit that there are 20 beads. Write 4 x 5 = 20. Ask students to show another group of beads.

e.g.,



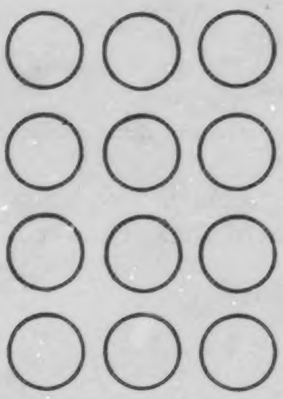
Ask "How many beads are there?" Elicit that there are 25. Write 5 x 5 = 25. Ask, "What is happening each time?" Elicit that we are adding on 5 each time. Say, "We can know any multiplication fact by adding on one more set of that number." Write 2 x 6 = 12. Ask, "How can I find 3 x 6? I can keep adding on sixes to obtain all the multiplication facts for 6."

Show the following on the flannel board.



Ask, "What multiplication fact does this array show?" Elicit that it shows 2 x 3 = 6. Write 2 x 3 = 6 on the chalkboard. Show the following array.

GETTING STARTED cont'd



Ask, "How many threes are there?" Elicit that there are 4 threes. Ask, "How much is 4 x 3?" Elicit that it is 12. Write this fact on the chalkboard under 2 x 3 = 6.
e.g.,

2 x 3 = 6
4 x 3 = 12.

Ask, "Do you see a relationship between the numbers in both equations?" Elicit that the 2 has been doubled and the 6 has been doubled in 2 x 3 = 6 to get 4 x 3 = 12. Say, "When we double the first factor, we double the product." Write on the chalkboard, 3 x 5 = 15. Say, "Double the three." Elicit that we will have 6. Say, "Therefore the product is doubled, since 6 x 5 = 30, and 30 is the double of 15. Patterns like these can help us to remember multiplication facts."

4.14.05

4.14.05.01 **compute multiplication basic facts through 9x9**

STRATEGY 1: Distribute a rexographed sheet to each student with 7 number lines:

3 6 9 12 . . . . . .
4 8 12 . . . .
5 . . . .
6 . . . .
7 . . . .
8 . . . .
9 . . . .

Each number line is marked off into ten spaces. Start at the first line. Say, "We are going to count by threes."

e.g., 3, 6, 9, 12, 15, 18, 21, 24, 27, 30

Enter the threes on the first line of the number line.

e.g.,

3 6 9 12 15 18 21 24 27 30
. . . .

Say, "This will help us to remember the multiplication facts for three. Place your finger at the fourth point." Help students to find. Ask, "How much is 4x3?" Elicit that it is 12. Repeat this procedure for 3x7, 3x9.

Complete number lines for 4, 5, 6, 7, 8, 9 in the same way, counting by fours for the 2nd line, fives for the 3rd line.

Say, "Use your chart to find 7x5. Find the row of fives, put your finger at the 7. How much is 7x5?" Elicit, 35.

Repeat this procedure for sixes, sevens, eights and nines.

4.14.05

STRATEGY 2: Show students a chart with the multiples of 3, 4, 5, 6, 7, 8, 9.

e.g.,

3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90

Distribute index cards or cut up construction paper cards and crayons. Ask the students to find the row of threes. Say, "Find the 4th number on that row. This means that there are 4 threes. What is the product of 4x3? Use the chart."

3 6 9 ⑫ 15 18 21 24 27 30

Elicit that the product of 4 times 3 is 12. Ask students to enter this fact on one of the cards and to place the product in the back.

e.g., $\boxed{\text{4x3}}$ $\boxed{12}$

front back

Repeat this procedure for facts for 4, 5, 6, 7, 8 and 9.

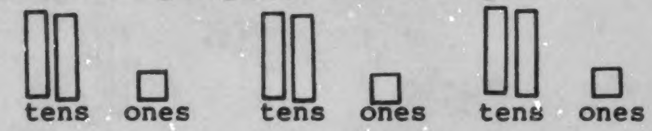
Say, "We can play a game with the cards. Place one card on your desk. Ask your neighbor to place a card on his desk. The person with the greatest product scores one point."

4.14.05

4.14.05.02 **multiply a two or three digit number by a one digit number with and without regrouping**

STRATEGY 1: Use felt backed squared material at the flannel board. Say, "Eddie has 3 packages of baseball cards. Each package has 21 cards. How many cards does Eddie have?" Ask a student to come to the felt board to show 3 groups of 21 with squared materials.

e.g.,



Elicit that each group needs 2 tens and 1 one. Reinforce that when we join equal groups, we multiply. Ask, "How much is 3 ones? (3) There are 2 tens, 3 times. How much is 3 times 2? (6) There are 6 tens and 3 ones in all. Let's show on the chalkboard what we just did."

Write on the chalkboard:

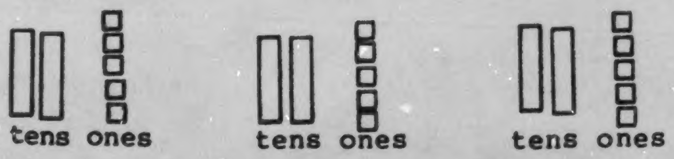
$$\begin{array}{cc} \text{tens} & \text{ones} \\ 2 & 1 \\ \underline{\times} & \underline{3} \end{array}$$

Ask, "How much is 3x1? (3) How much is 3x2? (6) There are 3 ones and 6 tens." Demonstrate on the chalkboard.

$$\begin{array}{ccl} \text{tens} & \text{ones} & \\ 2 & 1 & \\ \underline{\times} & \underline{3} & \\ 6 & 3 & \text{product} \end{array}$$

Label the answer as the product.

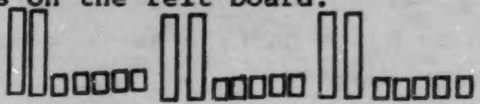
Say, "Peter has 25 cards in each package. There are 3 packages. How many cards does he have in all?" Ask a student to show 25 on the felt board, 3 times. Elicit the following response:



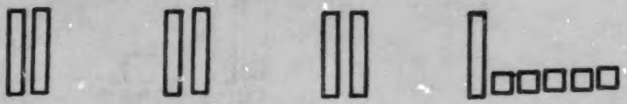
STRATEGY 1: cont'd

Say, "There are 3 fives. How much is this? (15) There are 3 groups of 2 tens. How much is this? (6) There are 6 tens and 15 ones. How can we regroup the ones?" Elicit the response, we can regroup ten of the ones for a ten. Ask a student to do this on the felt board.

1)



2)



Say, "Now we have 7 tens and 5 ones. Let's show what we did on the chalkboard."

e.g.,

$$\begin{array}{cl} \text{tens} & \text{ones} \\ 1 & \\ 2 & 5 \\ \underline{\text{x}} & \underline{3}\,)\,15 \\ 7 & 5 \text{ product} \end{array}$$

Say, "Regroup 15 ones as one ten and 5 ones." Label 75 as the product.

Say, "Jimmy had 126 cards in each package. He had 3 packages. How many cards did he have?"

Say, "Let's use at the chalkboard the same method we have been using at the felt board.

e.g.,

$$\begin{array}{ccc} \text{hundreds} & \text{tens} & \text{ones} \\ 1 & 2 & 6 \\ \underline{\text{x}} & & \underline{3} \end{array}$$

Ask, "How much are 3 sixes or 3x6? (18) How can you regroup 18 ones?" Elicit the response, we can regroup it as one ten and 8 ones. Show on chalkboard.

e.g.,

$$\begin{array}{ccc} & 1 & \\ 1 & 2 & 6 \\ \underline{\text{x}} & & \underline{3}\,)\,18 \\ & & 8 \end{array}$$

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4.14.05

STRATEGY 1: cont'd

Ask, "How much is 3 twos or 3x2? (6) There are 6 tens, and with the new ten we have 7 tens." Demonstrate on the chalkboard.

$$\begin{array}{cccl} \text{hundreds} & \text{tens} & \text{ones} & \\ & 1 & & \\ 1 & 2 & 6 & \\ \times & & 3 & \big)18 \\ \hline & 7 & 8 & \end{array}$$

Ask, "How much is 3 ones?" (3) Show on the chalkboard:

$$\begin{array}{cccl} \text{hundreds} & \text{tens} & \text{ones} & \\ 1 & 2 & 6 & \\ \times & & 3 & \big)18 \\ \hline 3 & 7 & 8 & \text{product} \end{array}$$

Say, "The product is 378." Label 378 as the product.

STRATEGY 2: Use felt cutouts of dollar bills and ten dollar bills. Say, "Karen's family is staying at a motel for 3 days. The cost is $23 per day. What will the total cost be?" Show on feltboard.

10 10 1 1 1

"This is the cost for one day. How will I find the cost for 3 days?" Elicit that I need $23 3 times.

e.g., 10 10 1 1 1 10 10 1 1 1
10 10 1 1 1

"How many one dollar bills are on the felt board?" Elicit that there are 3 threes, 3x3 = 9. "How many ten dollar bills are on the felt board?" Elicit that 3 twos or 3x2 = 6. "There are 6 ten dollar bills and 9 one dollar bills. How much money is this?" ($69.)

STRATEGY 2:
cont'd

Say, "Let's make an accounting of what Karen's family spent." Write the following example on the chalkboard.

tens	ones
2	3
x	3

"How much is 3x3?" (9.) "How much is 2x3?" (6.) "There are 6 tens and 9 ones."

e.g.,

tens	ones	
2	3	
x	3	
6	9	product

Label the product.

Say, "Sonia's family is spending $28 for each day. What will their cost be for 3 days?"

Show on felt board. 10 10 1 1 1 1 1 1 1 1
10 10 1 1 1 1 1 1 1 1 10 10 1 1 1 1 1 1 1 1

"How much are 3 eights or 3x8?" (24.) "How can I regroup 24 ones?" Elicit the response, we can use 2 ten dollar bills for 20 ones. Demonstrate on the felt board.

1) 10 10 1 1 1 1 1 1 1 1 10 10 1 1 1 1 1 1 1 1
10 10 1 1 1 1 1 1 1 1

2) 10 10 10 10 10 10 10 10 1 1 1 1

Say, "I regrouped 24 ones as 2 tens and 4 ones."

"How many tens are there now?" Elicit the response, there are now 8 tens. Write the following example on the chalkboard.

tens	ones	
2	8	) 24
x	3	

"How much is 3x8?" (24.) "Let's regroup 24 as 4 ones and 2 tens."

STRATEGY 2:
cont'd

Write the following example on the chalkboard.

```
tens  ones
  2
  2    8
  x    3
  ------
       4
```

Say, "How many are 3 twos?" (6.) "Add on the two tens that we regrouped. Now how many tens are there?" (8.) Write the following example on the chalkboard.

```
tens  ones
  2
  2    8)24
  x    3
  ------
  8    4   product
```

Say, "Fay's family is going on a trip all expenses included. If the cost is $125 for one day, what will be the cost for three days? Let's use the same method that we used for the other trips on the chalkboard." Write the following example on the chalkboard.

```
hundreds tens ones
    1      2   5
    x          3
    -----------
```

"How much is 3 fives?" (15.) "How do I regroup 15?" Elicit the response, we regroup it as one ten and 5 ones. Write the following example on the chalkboard.

```
hundreds tens ones
           1
    1      2   5)15
    x          3
    -----------
               5
```

STRATEGY 2: cont'd

Say, "How much is 3x2?" (6.) "Add on the one ten that we regrouped. Now how many tens are there?" (7.) Write the following example on the chalkboard.

hundreds	tens	ones	
	7		
1	2	5	)15
x		3	)
	7	5	

Say, "How much is 3x1?" (3.) "There are 3 hundreds, 7 tens and 5 ones. Faye's family will spend $375." Write the following example on the chalkboard.

hundreds	tens	ones	
	1		
1	2	5	
x		3	
3	7	5	product

P.O. 4.14.05.01

NAME: ____________________ CLASS: ________ DATE: ________

Directions: Find the products. Mark the X's and O's to find out who wins the game of Tic - Tac - Toe.

Player X	Player O
42	27
63	21
32	48

Game 1

8x7	6x8	7x9
9x6	6x7	3x9
4x8	7x7	7x3

The winner is ____________

Player X	Player O
14	45
48	54
21	24

Game 2

5x9	3x7	6x8
6x9	7x2	3x9
4x6	4x4	7x4

The winner is ____________

Player X	Player O
40	36
28	72
27	12

Game 3

7x4	4x9	3x9
6x5	9x8	8x5
3x8	3x4	7x7

The winner is ____________

Player X	Player O
45	14
42	40
24	54

Game 4

9x6	3x7	5x9
7x7	7x2	6x7
8x5	6x6	3x8

The winner is ____________

P.O. 4.14.05.02

NAME:____________________ CLASS:________ DATE:_______

Directions: Find the products and match them with the letters to spell out the answer to the question.

What's red and goes up and down?

304   168 318 185 304 168 318

I
111 161   304 161

128 230 128 292 304 168 318 265

I
37
x 3
111

L
46
x 5

E
32
x 4

V
73
x 4

N
23
x 7

A
76
x 4

R
53
x 5

T
42
x 4

O
53
x 6

M
37
x 5

202

4.04.01 BASIC MULTIPLICATION FACTS FOR 11 AND 12 THROUGH 144

(1-2 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

4.04.01.01A recognize the basic multiplication facts for 11 and 12 through 144;
e.g.,

$8 \times 11 = 88$

$6 \times 12 = 72$

4.04.01.02A solve word problems related to skills learned in this module.
e.g.,

John had 12 cars. Bob had 4 times as many cars. How many cars did Bob have?

$12 \times 4 = 48$ cars

4.04.01

VOCABULARY

TERMS

distributive property
multiple(s)
array

GETTING STARTED

Write the following on the chalkboard.

Fill in the missing numbers.

0, 10, 20, (30), (40), (50), 60, (70), (80), (90)

Ask a student to fill in the spaces. Say, "The missing numbers are multiples of what number?" (10)

Write the following on the chalkboard.

10 + 10 + 10 + 10 = (40)

Ask a student to fill in the missing sum. Ask, "How many times is 10 written on the chalkboard?" (4 times).

Write 4 x 10 = (40) under 10 + 10 + 10 + 10 = (40)

Ask a student to fill in the product.

Ask, "Why is the answer to 10 + 10 + 10 + 10 equal to the answer for 4 x 10?" Elicit that we added the number 10 four times.

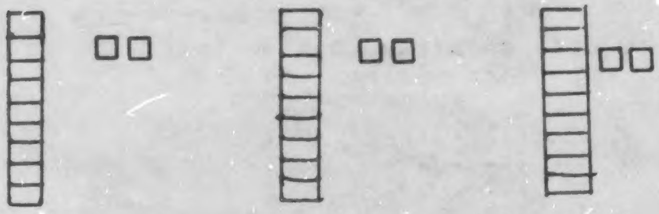
Repeat this procedure using other examples.
e.g., 6 tens and 9 tens

Ask, "Is it easier to do repeated addition or multiplication?" Elicit that multiplication is faster than repeated addition.

Reinforce the importance of knowing products by playing Buzz. Establish an order in which students participate. Select a multiple, e.g., 10. Say, "For every multiple of 10 say 'Buzz'. e.g., 8, 9, "buzz," 11, 12..."

GETTING STARTED cont'd

Show three sets of squared material.



Say, "Anna bought three pencils. Each pencil cost 12¢. How much did Anna spend for the pencils? How can we use the squared material to find the answer to our problem?" Solution strategies may vary. Some students may suggest adding 12 + 12 + 12. Lead students to discover that three sets/groups of 10 = 30, and three sets/groups of 2 = 6, or 30 + 6 = 36. Therefore, Anna spent 36¢.

Repeat this procedure using other examples, e.g., Bob bought 4 donuts. Each donut cost 11¢. How much money did Bob spend in all? (4 x 10 = 40 and 4 x 1 = 4 40 + 4 = 44) Bob spent 44¢.

4.04.01

4.04.01.01 multiplication facts for 11 and 12 through 144

STRATEGY 1: On the chalkboard draw an array to show 3x11.

1) . . . .
. . . .
. . . .

Say, "This array shows that 3x11 = 33."

Draw the following examples below the array on the chalkboard.

a) . . . . b) .
. . . .
. . . .

Ask, "What does array 'a' show?" (3x10 = 30) Write 3x10 below array 'a'. "What does array 'b' show?" (3x1 = 3) Write 3x1 below array 'b'.

"What do you notice when you compare array '1' with array 'a' plus array 'b'?" Elicit the response, array "1" shows a total of 33 dots and array "a" plus array "b" also shows a total of 33 dots. Array "1" has been separated into two side-by-side arrays, a and b.

Draw the following arrays on the chalkboard.

3x12 3x10 3x2
....
....
....

Write following the example on the chalkboard.

3x12 = 3x10 + 3x2
= 30 + 6
= 36

Ask, "How did we use 3x12 to obtain 3x10 + 3x2?" Elicit the response, we renamed 12 as 10+2.

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STRATEGY 1: cont'd

Say, "When we separated the array that showed 3x12 into arrays that showed 3x10 + 3x2, we used the distributive property of multiplication."

Write "distributive property of multiplication" on the chalkboard. Say, "We distributed the multiplication over two separate parts of 12, 10 and 2.

Ask a student to explain how we can use the distributive property of multiplication to learn multiplication facts for 11 and 12. Their answer should include the idea that we already know all of the multiplication facts for the number 10. We also know the multiplication facts for numbers 1 through 9. Therefore, we have only to combine what we already know.

Reinforce by asking students to write in their notebooks the multiplication facts for 11 and 12 through 11x11 and 12x12.

e.g.,

1x11 = 1x10 + 1x1 = 11
2x11 = 2x10 + 2x1 = 22

Discuss the pattern that emerges in the multiplication facts for 11 through 9x11 (the other number/factor is repeated twice as the answer/product, e.g., 3x11 = 33)

Ask the students if they can discover a pattern for the multiplication facts for 12. The products are even; e.g., 12, 24, 36, 48, 60 ...

STRATEGY 2: Distribute graph/grid paper to the students. Say, "We'll use this graph/grid paper to discover multiplication facts for the number 11."

STRATEGY 2: cont'd

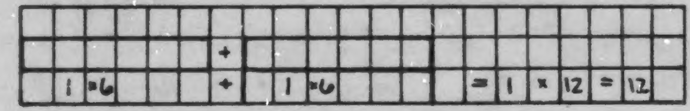
On the chalkboard draw a large grid. Use colored chalk to outline one row of 11. Write 1x11 = 11 below it. Say, "On your paper show one row/set of 11 just as I did on the chalkboard." Repeat this procedure adding one row/set of 11 through 11x11 = 121.

"What pattern did you discover in the multiple of 11 (through 9x11)? Elicit the response, each product/multiple is the next larger digit in the tens place and ones place, e.g., 11, 22, 33... Students should notice that each digit in the product/multiple is the same as the factor that 11 is multiplied by, e.g., 2x11 = 22, 5x11 = 55.

Distribute additional graph/grid paper to the students. Say, "Let's use this paper to find the multiples of 12. We'll use the facts that we already know to help us. We know the multiplication facts for 6. We can double the facts for 6 to learn the facts for 12. Why is this true?" Elicit the response, 2 sixes = 12 or 2x6 = 12.

Draw a large grid on the chalkboard. Use colored chalk to outline one row of 6 and side by side another row of 6. Label.

e.g.,



Repeat this procedure through 12x12 = 144.

Reinforce multiplication facts for 11 and 12 by having students make "concentration" or "match" cards on index cards. Place each example on a separate card; e.g., 4x12 7x11 and each product on a separate card, e.g., 48 77. Cards are placed face down in rows that contain only products. Each student in turn draws one

STRATEGY 2: cont'd

card from the factor row and one card from the product row. If the cards match, e.g., 4x12 and 48 , the student keeps the cards and draws again. If there is no match, the next student takes a turn.

4.04.01.02 **solve word problems relating to skills learned in this module**

STRATEGY 1:

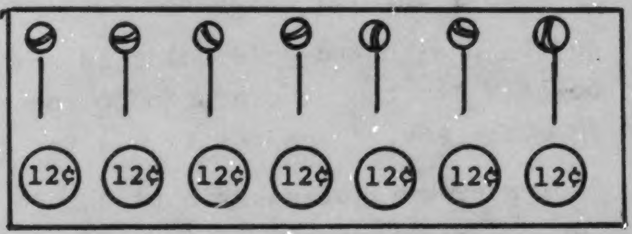
Say, "Mary bought 7 lollipops at 12¢ each. How much money did 7 lollipops cost?"

"What does the problem ask us to find out?" Elicit the response, the cost of 7 lollipops.

"What information do we have?" (7 lollipops, each lollipop costs 12¢)

"Let's draw a picture to help us solve this problem." Distribute unlined paper to each student. After work is completed, ask students to draw their pictures on the chalkboard.

e.g.,



Ask, "How can we use these pictures to get the answer to our problem?" Elicit that we could add 12¢ seven times, e.g., 12¢+12¢+12¢+12¢+12¢+12¢+12¢. Lead students to discover that a shortcut to repeated addition is multiplication, e.g., 7x12¢ = 84¢.

Repeat this procedure using other problems, e.g.,

John had 12 cars. Bob has 4 times as many cars. How many cars does Bob have?

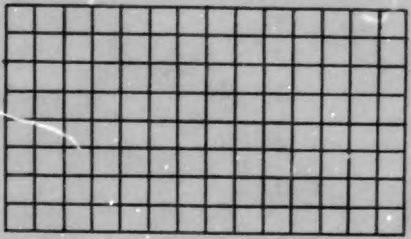
STRATEGY 2: Say, "Mr. Green packs 12 bars of candy in one box. How many bars of candy can he put into 6 boxes?"

"What does the problem ask us to find out?" Elicit the response, to find out how many bars of candy can be put into 6 boxes.

"What information do we have that will help us solve the problem?" (12 bars of candy in each box, 6 boxes in all)

Distribute graph/grid paper to each student.

Draw a grid on the chalkboard.
e.g.,



Say, "Let's use our graph/grid paper to help us solve this problem."

"How many bars of candy fit into one box?" (12)

On the chalkboard grid color in one row of 12 boxes. Ask the students to do the same on their sheets. Say, "Each box stands for one candy bar."

"How many rows of candy bars should we color?" (6) "Why?" Elicit the response, each row stands for one box of candy so we need 6 rows to represent 6 boxes.

"How can we use our graph/grid to solve the problem?" Elicit the response, we could add 12 six times. "A shortcut for repeated addition is multiplication." Write 6x12 = ___, beneath the colored diagram on the chalkboard. "What is 6x12 = ___?" (72)

STRATEGY 2: cont'd

Repeat this procedure using other examples. e.g., John had 12 cars. Bob had 4 times as many cars. How many cars does Bob have? (48)

P.O. 4.04.01.01

NAME: ______________________ CLASS: __________ DATE: ________

1. Multiply. Fill in the blanks.
2. Find the products. Color the products greater than 75 green. Color the products less than 75 yellow.

1.

a.

$5 \times 12 = 5 \times (10+2)$

$= (5 \times 10) + (5 \times 2)$

$= \_\_\_ + \_\_\_$

$= \_\_\_$

b.

$7 \times 11 = 7 \times (10+1)$

$= (7 \times 10) + (7 \times 1)$

$= \_\_\_ \quad \_\_\_$

$= \_\_\_$

c.

$8 \times 12 = 8 \times (10 + \_\_)$

$= (8 \times \_\_) + (8 \times \_\_)$

$= \_\_\_ \quad \_\_\_$

$= \_\_\_$

d.

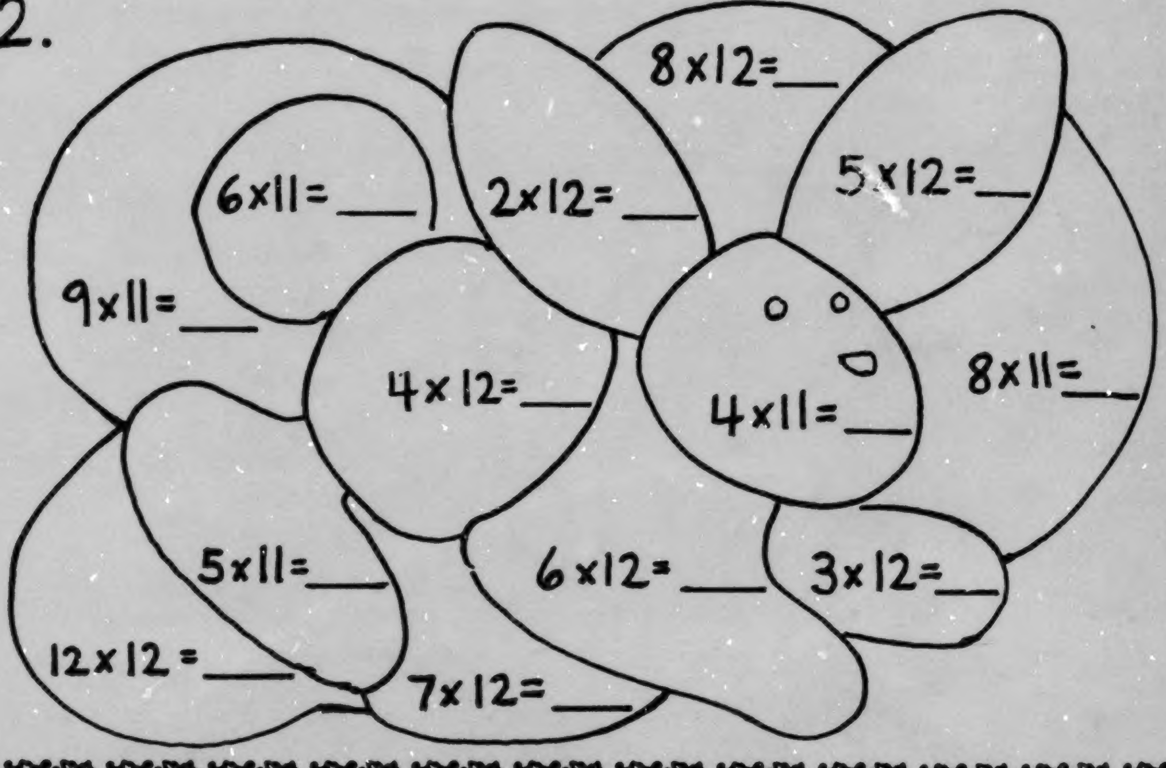
$9 \times 11 = 9 \times (\_\_ + \_\_)$

$= (\_\_ \times \_\_) + (\_\_ \times \_\_)$

$= \_\_\_ \quad \_\_\_$

$= \_\_\_$

2.


8×12=___
6×11=___
2×12=___
5×12=___
9×11=___
4×12=___
4×11=___
8×11=___
5×11=___
6×12=___
3×12=___
12×12=___
7×12=___

P.O. 4.04.01.02

NAME: ______________________ CLASS: ________ DATE: ________

Solve each problem. Check your answer.

1. Tom's dog eats 11 pounds of dog food each week. How many pounds of dog food will he eat in 7 weeks? 11 x7 77	2. The fourth grade class planted 8 pumpkin seeds in each of 12 pots. How many pumpkin seeds did they plant?
3. Marie's bookcase has 9 shelves. Each shelf has 12 books. How many books does Marie have?	4. There are a dozen eggs in each carton. How many eggs are there in 12 carton?
5. Bill said; "I'm thinking of a number that is 3 times as large as 11". What number is Bill thinking of?	6. Super Sleuth Challenge! Mike and Jim played basketball for 12 days. Each day Mike made 5 baskets and Jim made 2 baskets. (a) How many baskets did Mike make in all? (b) How many baskets did Jim make in all? (c) How many baskets did both boys Make?

4.14.06 REVIEW - DIVISION

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.14.06.01 compute basic division facts through 81 ÷ 9; e.g.,

$$\begin{array}{r} 8 \\ 3\overline{)24} \end{array} \quad \text{or } 24 \div 3 = 8$$

4.14.06.02 divide a 2- or 3-digit dividend by a 1-digit divisor without regrouping and no remainder. e.g.,

$$\begin{array}{r} 21 \\ 3\overline{)63} \end{array} \qquad \begin{array}{r} 321 \\ 3\overline{)963} \end{array}$$

4.14.06

VOCABULARY

TERMS

divide
quotient
share
equal sets
inverse

GETTING STARTED

Show a paper plate or sheet of cardboard with some strings or rubber bands. Ask three students to come to the front of the room. Say, "Let's imagine that there is a large dish of spaghetti. How will you share it?" Help students to dramatize that they each will take an equal amount. Ask, "What will happen to the spaghetti that is left in the dish?" Elicit that each can again take an equal amount until there is little or none left on the plate.

Ask, "What is the term we use in math when we talk about sharing equal groups?" Elicit the term is divide. Write the term divide on the chalkboard. Ask, "What is the answer called when we divide?" Elicit that the word is quotient. Write the word quotient on the chalkboard.

Show on the felt board, □□ □□□. Ask, "How much is 2 + 3?" Elicit that it is 5. Then, cover on the felt board, □□ ☒☒☒. Ask, "How much is 5 - 3?" Elicit it is 2. Ask, "What do you notice about the two equations?"

e.g.,

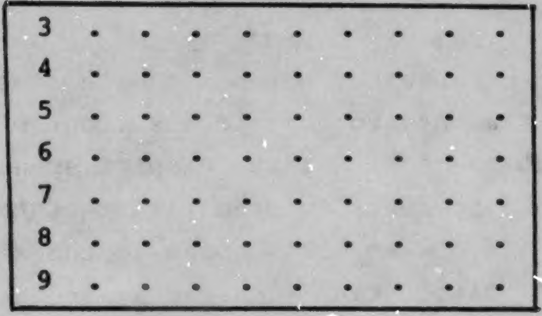
$$2 + 3 = 5$$
$$5 - 3 = 2.$$

Elicit that one is addition and one is subtraction and that subtraction is the opposite, or inverse, of addition. Subtraction "undoes" addition. Say, "The same is true with multiplication and division." Write on the chalkboard, 2 x 3 = 6. Ask, "What will the inverse be?" (Division). Elicit that 6 ÷ 3 = 2. Division "undoes" what multiplication "does."

4.14.06

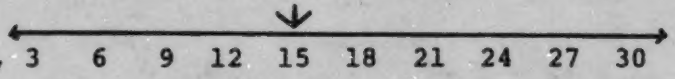
4.14.06.01 **compute basic division facts through 81÷9**

STRATEGY 1: Say, "We would like to make a chart to show all the multiples of the numbers 3 through 9." Distribute seven number lines on a rexograph to each student .



Say, "How quickly can you write all the multiples for 3?" "Show all the multiples for three on the first line." Ask a student to read the multiples. Repeat this procedure for the multiples of 4, 5, 6, 7, 8 and 9. "We would like to use this chart to help us with division facts. In the first row, place your finger on the fifteen. Count all the threes that you see until you reach the number 15."

e.g.,



"How many numbers did you count?" (5.) "How many threes did we find to make 15?" (5.) Write on chalkboard: 15÷3 = 5.

Say, "Find the row with the multiples of 8." Elicit the response,

"8 16 24 32 40 48 56 64 72 80."

"Find the 56."

4.14.06

STRATEGY 1: cont'd

"How many eights are in 56?" Help students to move along the row of eights.

8 16 24 32 40 48 (56) 64 72 80

Elicit the response, "There are 7 eights in 56." Write on the chalkboard: 56÷8 = 7.

Distribute index cards or small slips of paper to students. Say, "Let's write these division facts on cards so that we can study them later. Write 15÷3 on the first card. Write the quotient 5 on the reverse. Repeat this procedure for the multiples of 4, 5, 6, 7 and 9.

STRATEGY 2: Show students a multiplication chart.

e.g.,

0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81

Say, "Use this chart to find 3x4." "What is the product? (12.) Write 3x4 = 12 on the chalkboard.

Reinforce that division is the inverse of multiplication; division "undoes" what multiplication "does".

4.14.06

STRATEGY 2: cont'd

Ask, "How can I write the division fact related to 3x4 = 12?" Ask a student to come to the chalkboard to write 12÷4 = 3.

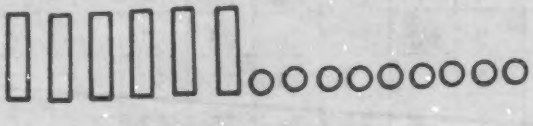
Repeat this procedure for 3x7, 4x9.

Distribute index cards or small slips of paper to students. Say, "Let's make study cards to help remember division facts. Write the fact 12÷4 on one side of the card. Write its quotient on the reverse side."

Repeat this procedure for 21÷7, 36÷9, then all other facts.

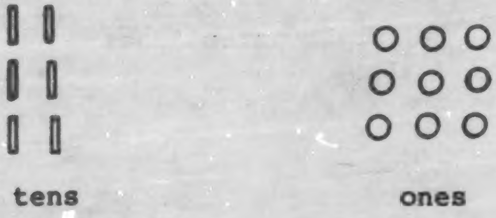
4.14.06.02 **divide a two- or three- digit dividend by a one-digit divisor with no exchange and no remainder**

STRATEGY 1: Place on felt board 6 tens and 9 ones using felt-backed squared material.



Say, "What number does this represent?" (69.) "Michael is working in the library. He has 69 books. He would like to place these books on 3 shelves. How can he do this?"

Ask a student to come to the felt board to separate the felt pieces into 3 equal groups as shown in the following example.



STRATEGY 1: cont'd

Ask, "How many books will be placed on each shelf?" (23.) "How did you separate the 69?" Elicit the response we placed the tens into 3 groups, then the ones. "When we separate into equal groups, what process do we use?" (Divide.) Write the following example on the chalkboard.

```
     tens ones
   _____________
 3 )  6     9
```

"How much is 6÷3?" (2.) Write the following example on the chalkboard.

```
     tens ones
      2
   _____________
 3 )  6     9
```

Say, "We used 2 tens 3 times. We placed 2 tens on 3 shelves." How much is 2 tens or 20x3?" (60.) Write the following example on the chalkboard.

```
      2
   _____________
 3 )  6     9     we had
      6     0     we used
     __________
```

"Let's see how many books are left. What process should we use?" Elicit the response, "We subtract." Show the following example on the chalkboard.

```
    tens ones
     2
   ____________
 3 ) 6     9      we had
   - 6     0      we used
     _________
           9      are left
```

Say, "Nine books are left. How much is 9÷3?" (3.) "We used 3, 3 times. How much is 3x3?" (9.) Write the following on the chalkboard.

4.14.06

STRATEGY 1: cont'd

$$\begin{array}{rl} 2\,3 & \\ 3\,\overline{)\,6\,9} & \text{we had} \\ -\underline{6\,0} & \text{we used} \\ 9 & \text{were left} \\ -\,\underline{9} & \text{we used} \end{array}$$

"How much is left?" (0.) Place a zero under the 9. "The quotient is 23." Label the quotient.

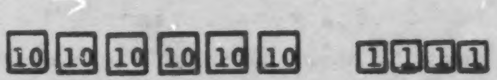
Repeat this procedure for the following examples.

e.g.,

(1) $4\,\overline{)48}$ (2) $3\,\overline{)699}$

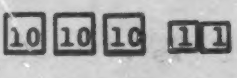
STRATEGY 2: Use felt backed paper money on felt board.

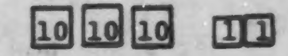
Say, "The twins received $64 for their birthday. How can they share this? "What process do we use when we say 'share'?" Elicit the response, "We divide." Show the example on felt board.



Ask a student to come up to divide into 2 equal groups. Demonstrate on the felt board.

e.g.,





"How much will each twin receive?" (32 dollars.)

Write the following example on the chalkboard.

e.g.,

$$\begin{array}{r} \text{tens ones} \\ 2\,\overline{)\,6\quad 4} \end{array}$$

Say, "How much is 6÷2?" (3.) "We gave 3 tens to each twin. Write the 3 in the tens place." Write the following on the chalkboard.

$$\begin{array}{r} 3 \\ 2\,\overline{)\,6\quad 4} \end{array}$$

STRATEGY 2: cont'd

"We gave each twin 3 tens or 30 dollars. How much did we give?" Elicit the response, "30x2 = 60." Write the following on the chalkboard.

$$\begin{array}{rcc} & \text{tens} & \text{ones} \\ & 3 & \\ \cline{2-3} 2\,) & 6 & 4 \\ & 6 & 0 \\ \cline{2-3} \end{array}$$

Say, "How much is left?" (4 ones.) "How much is 4÷2?" (2.) "We gave each twin $2. How much is 2X2?" (4.) Write the following on the chalkboard.

$$\begin{array}{rcc} & \text{tens} & \text{ones} \\ & 3 & 2 \\ \cline{2-3} 2\,) & 6 & 4 \\ & -\underline{6} & \underline{0} \\ \cline{2-3} & & 4 \\ & & -\underline{4} \end{array}$$

"How much is left?" (Zero.) Write a zero under the 4. Label 32 as the quotient.

Repeat this procedure for the following examples. e.g.,

(1) $3\overline{)96}$ (2) $3\overline{)369}$

P.O. 4.14.06.01

NAME:____CLASS:__________DATE:________

1. Write the related division fact.

① Write the related division fact.

3 x 5 = 15
15 ÷ 5 = 3

7 x 2 = 14
14 ÷ 2 =

8 x 3 = 24
24 ÷ 3 =

7 x 6 = 42
__ ÷ __=

3 x 9 = 27
__ ÷ __=

6 x 3 = 18
__ ÷ __=

4 x 9 =
__ ÷ __=

4 x 7 =
__ ÷___=

5 x 9 =
__ ÷___=

3 x 8 =
__ ÷ __=

5 x 6 =
__ ÷ __=

5 x 7 =
__ ÷ __=

9 x 2 =
__ ÷ __=

8 x 9 =
__ ÷___=

7 x 9 =
__ ÷__ =

4.14.06.01 (cont'd)
P.O.____________

NAME:____CLASS:_________DATE:_______

2. Can you see a pattern?
3. Match the quotients with the division fact.

② Do you see a pattern?

12 ÷ 4 =
16 ÷ 4 =
20 ÷ 4 =
24 ÷ 4 =

36 ÷ 9 =
45 ÷ 9 =
54 ÷ 9 =
63 ÷ 9 =

72 ÷ 8 =
64 ÷ 8 =
56 ÷ 8 =
48 ÷ 8 =

③ Match the quotient with the division fact.

6 ÷ 6	7
16 ÷ 2	8
36 ÷ 9	2
72 ÷ 8	1
63 ÷ 9	3
40 ÷ 8	4
15 ÷ 5	6
36 ÷ 6	5
12 ÷ 6	9

P.O. 4.14.06.02

NAME:____CLASS:_________DATE:_______

Directions: Solve the problems. Find the number that each letter represents. Fill in the blanks with the letters each number represents to find "who's there?"

KNOCK! KNOCK!
WHO'S THERE?

$\overline{24}$ $\overline{334}$ $\overline{231}$ $\overline{22}$ $\overline{24}$

$\overline{24}$ $\overline{334}$ $\overline{231}$ $\overline{22}$ $\overline{24}$ $\overline{212}$ $\overline{21}$ $\overline{23}$

$\overline{24}$ $\overline{334}$ $\overline{231}$ $\overline{22}$ $\overline{24}$

$\overline{220}$ $\overline{124}$ $\overline{334}$ $\overline{33}$ $\overline{231}$ $\overline{420}$.

A $2\overline{)48}$ O $3\overline{)69}$ C $2\overline{)66}$

N $2\overline{)668}$ P $4\overline{)880}$ T $3\overline{)66}$

I $3\overline{)693}$ E $2\overline{)248}$ W $4\overline{)848}$

H $3\overline{)63}$ L $2\overline{)840}$

Unit 17

4.05.01 PROPERTIES OF DIVISION

(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

4.05.01.01A recognize that using zero as the divisor is meaningless. The quotient will always be undefined;
e.g.,

$$0\overline{)12}$$

4.05.01.02A recognize that any number divided into zero will always give a quotient of zero;
e.g.,

$$10\overline{)0} \qquad 28\overline{)0} \qquad 362\overline{)0}$$

4.05.01.03A use one (1) as a divisor;
e.g.,

$$7 \div 1 = 7$$

$$\begin{array}{r} 7 \\ 1\overline{)7} \end{array}$$

4.05.01.04A

check division examples using multiplication (the inverse operation of division);
e.g.,

$\frac{48}{8}$ is the same as $8\overline{)48}$

48 divided by 8 is 6 because
$8 \times 6 = 48$

4.05.01.05B

identify a distributive property of division over addition or subtraction.
e.g.,

$$48 \div 5 = \frac{45+3}{5} = \frac{45}{5} + \frac{3}{5} = 9\ \frac{3}{5}$$

$$48 \div 5 = \frac{50-2}{5} = \frac{50}{5} - \frac{2}{5} = 10 - \frac{2}{5} = 9\ \frac{3}{5}$$

4.05.01

VOCABULARY

TERMS

dividend
divisor
quotient
distributive property

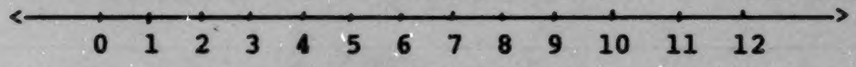
GETTING STARTED

Play the Rabbit game on a number line to illustrate division. Say, "All rabbits in the world are having a convention, and they are all standing on 12. The rabbits claim they can make it to zero if they start to jump, going to the left.

Remember a rabbit jumps the same number of spaces each time according to the number in his name. A three rabbit always jumps three spaces in a single jump."

Draw a number line on the chalkboard.

e.g.,



Use colored chalk to show the jumps.

Say, "Who can show us which rabbit is telling the truth? Draw arcs on the number line to show the way he jumps."

Draw this chart on the chalkboard.

Rabbit	Numbers Landed On	Number of Jumps

Have the students complete the chart as they show the jumps on the number line. Do not record the jumps on the chart if the rabbit isn't telling the truth, e.g., If he doesn't land on zero.

GETTING STARTED cont'd

The chart should look like the following.

Rabbit	Numbers Landed On	Number of Jumps
6	6, 0	2
3	9, 6, 3, 0	4
4	8, 4, 0	3
2	10, 8, 6, 4, 2, 0	6
1	11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0	12
12	0	1

Say, "Which rabbit took the most jumps?" (1)

"Which rabbit took the least number of jumps?" (12)

Relate this to division by saying, "What is 12 divided by 3? Think of 12 on the number line with a 3 rabbit. How many jumps does the rabbit take to reach zero? (4) Then 12 divided by 3 is 4."

Repeat the exercise on different number lines such as 18 or 20.

Use objects such as cubes, discs, buttons to separate sets into subsets. Have the students show 16 buttons. Say, "Find the number of fours in 16?" The student should show sets of 4.

e.g.,

0000 0000 0000 0000

Write the following on the chalkboard.

How many fours are there in 16?" (4) 16 ÷ 4 = 4

Say, "How many sets? (4) How many buttons on each set? (4)
How many buttons altogether? (16) What is the multiplication sentence?" (4 x 4 = 16)

GETTING STARTED cont'd

Repeat this procedure separating other sets into subsets. Write the following on the chalkboard.

$$\begin{array}{rl} & \text{quotient} \\ \text{divisor} & \overline{\smash{)}\,\text{dividend}} \end{array}$$

Reinforce the three division vocabulary words by writing them on flash cards. Have a student match the flash cards to the correct words written on the chalkboard.

Write a division problem on the chalkboard, e.g., $6\overline{)18}$.

Ask a student to match each number to the correct vocabulary word.

4.05.01

4.05.01.01 **recognize that using zero as the divisor is meaningless. The quotient will always be indeterminate**

STRATEGY 1: Say, "Find the quotient of each division fact below by using a related missing factor statement.

Write:

$\overset{?}{3\overline{)6}}$ x3=6

Say, "What number times 3 equals 6?" 2.

$\overset{?}{2\overline{)6}}$ x2=6

Say, "What number times 2 equals 6?" (3)

$\overset{?}{1\overline{)6}}$ x1=6

Say, "What number times 1 equals 6?"(6)

$\overset{?}{0\overline{)6}}$ Say, " x0=6. Is there a number that when multiplied by zero will equal 6?" (No.) "Why?" Elicit the response, there is no number that can be multiplied by 0 to give the product 9. Say, "What happens when any number is divided by zero?" Elicit the response, there is no answer.

STRATEGY 2: Write 0÷0 = on the chalkboard. Say, "What is the related multiplication sentence?" (x0=0) Find a number to make the multiplication sentence true." (Any number) Write on the chalkboard, 3x0 = 0. Say, "Find another number to make it true." Write 8x0=0 on the chalkboard. Say, "What numbers would make it true? All numbers. Say, "When we divide by zero the answer is meaningless."

4.05.01

STRATEGY 2: cont'd

Reinforce by asking the students to write answers for the following examples:

(1) 0÷7=
(2) 0÷6=
(3) 0÷0=
(4) 2÷0=
(5) 0÷2=

4.05.01.02 **recognize that any non-zero number divided into zero will always give a quotient of zero**

STRATEGY 1:

Draw a set of 8 circles on the chalkboard. Have a student divide the set by 2. Elicit from the student that the quotient is 4. Draw the empty set (   ) on the chalkboard. Say, "How many members are in the empty set?" (0.) Have a student try to divide the set by 4. Elicit from the student that the quotient would be 0. Repeat the procedure using 3 as the divisor. Say, "How many sets of 3 are there in the empty set?" (Zero sets of three.) "What is the quotient?" (0.) Repeat using a variety of divisors. Say, "What will be the quotient if zero is divided by any number?" (0.)

STRATEGY 2: Use a bag containing objects such as cubes, beans, pebbles, ... Have students remove zero (0) objects three times. Record the number of objects removed each time. Write number sentences describing the activity

e.g.,

0+0+0=0

3x0=0

Repeat the procedure to lead to the following equations.

4x0=0　　5x0=0　　6x0=0

Say, "What is the product when zero is one of the factors?" (The product is zero) Write the following examples on the chalkboard.

If 3x0=0, then 0x3=

If 4x0=0, then 0x4=

Say, "Does the order of the factors make a difference in multiplication?" (No.) Have the students write the products in the empty boxes. Say, "What is the product when zero is one of the factors?" 0. Write this on the chalkboard:

0÷2= or x2=0

Say, "What is the missing factor if the product is 0?" (0.) "What is the quotient?" (0.)

Repeat this procedure using the following examples.

0÷4= or x4=0

0÷9= or x9=0

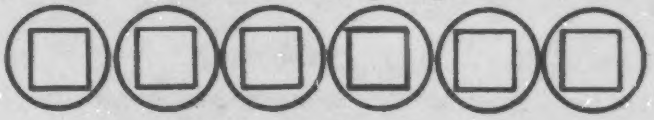
Say, "If 0 is divided by any number (except 0), what is the quotient?" (0.) Write on the chalkboard, 0÷N=0.

4.05.01

4.05.01.03 **use one (1) as a divisor**

STRATEGY 1: Use objects such as discs, cubes or buttons. Say, "Show a set of 6 cubes."

Have the students show groups of 1.



Say, "How many groups of 1 are there in 6?" There are 6 groups of 1.
Write this on the chalkboard.

Number of groups
Groups of $\begin{array}{r} ? \\ 1\overline{)6} \end{array}$ cubes $6 \div 1 =$

Repeat the activity with the indicated number of cubes and record.

$\begin{array}{r} 6 \\ 1\overline{)6} \end{array}$ $6 \div 1 = 6$

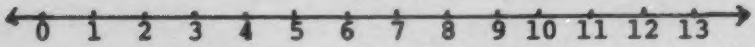
$\begin{array}{r} 3 \\ 1\overline{)3} \end{array}$ $3 \div 1 = 3$

$\begin{array}{r} 7 \\ 1\overline{)7} \end{array}$ $7 \div 1 = 7$

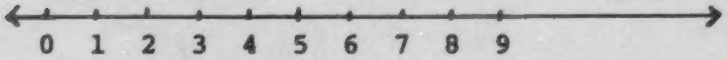
Say, "Look at the quotients and the dividends. What do you notice? They are the same. What is the quotient when the division is 1?" It is the same as the dividend.

4.05.01

STRATEGY 2: Draw a number line on the chalkboard.



Start at 9, say, "How many moves of one can I make to get to zero?" Ask a student show this on the number line.



Start at 8. Say, "How many moves of one can I make to get to zero?" Show this on the number line. Repeat on 7, 5,3 and 2. List the moves on the number line and the responses as division sentences.

e.g.,

9÷1=9

8÷1=8

7÷1=7

5÷1=5

3÷1=3

2÷1=2

Say, "What is the quotient when a given number is divided by 1?" Elicit the response, it is the same as the dividend.

4.05.01.04 **check division examples using multiplication (the inverse operation of division)**

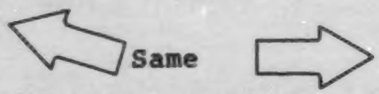
STRATEGY 1: Write a known division fact on the chalkboard and find the quotient, e.g. 12÷4= Say, "How many fours are there in 12? 3. What is 12 divided by 4?" 3. Show how the division can be checked by multiplication. Point to the quotient and the divisor. Say, "What is three times four?" 12. What do you notice about the dividend and the

STRATEGY 1: cont'd

product?" Elicit the response, they are the same. Write the following example on the chalkboard.

Divide

$$4\overline{)12}^{\,3}$$



Check

$$\begin{array}{r} 4 \\ \underline{\times 3} \\ 12 \end{array}$$

Rewrite the example in the following form.

12÷4=3 Because 3x4=12

Say, "There is another division symbol."
Write this division symbol on the chalkboard.

$$\frac{\quad}{\quad} = \square$$

"The dividend goes above the line and the divisor goes below the line. The quotient belongs in the box. Using the above example, where would you put the 12?" Elicit the response, above the line; the 4? below the line; and the three? in the box.
Write the following example on the chalkboard.

$$\frac{12}{4}=3$$

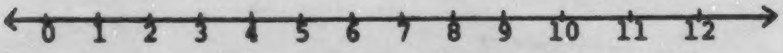
Say, "$\frac{12}{4}$ can also mean that we are finding $\frac{1}{4}$ of 12. This can be written $\frac{1}{4}$ x 12."
Write $\frac{12}{4} = \frac{1}{4}$ x 12 on the chalkboard. "How is this example checked? Elicit the response, use multiplication.
Write the following example on the chalkboard.

Division	Check
$\frac{12}{4}=3$	3x4=12

Ask the students to complete the chart.

÷	$\overline{)\quad}$	——	check
18÷6=☐	6 8	$\frac{18}{6}$	3 x 6 =18
21÷7=☐			☐x☐ =21
35÷7=☐			☐x☐ =35
56÷8=☐			☐x☐ =56

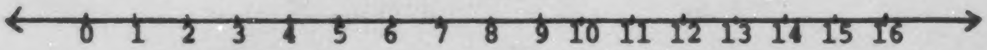
STRATEGY 2: On a number line start at 12 and draw moves of 2 to zero.



Say, "What is the starting number? (12.) How many moves of 2 to reach zero from 12? (6.) How many twos are there in 12? (6.) What division sentence would describe 6 moves of 2 from 12 to zero?" (Record 12÷2=6) "What can I do to the 6 and the 2 to get 12?" (6x2=12.) Show this on the number line. Repeat with another known division fact. "Do you see a way to check a division example?" Elicit the response, multiply the quotient and the divisor. Show how a divisor with a remainder can be checked by multiplication and addition.

Divide	Check
$\begin{array}{r} 3 \text{ r1} \\ 5\overline{)16} \end{array}$	$\begin{array}{r} 5 \\ \underline{\times\ 3} \\ 15 \\ \underline{+1} \\ 16 \end{array}$ add remainder

Show this on the number line.



"Solve and check the following division problems."

$2\overline{)14}$ $3\overline{)21}$ $5\overline{)29}$

236

4.05.01

4.05.01.05 **identify a distributive property of division over addition or subtraction**

STRATEGY 1: Ask students to use a number line to rename 17.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

Record the renamings on the chalkboard.
e.g., 17=20-3
17=10+7
17=2+15

Write the following division example on the chalkboard.

$$5\overline{)17}$$

Say, "Since 17=20-3 we can divide 20 by 5 and 3 by 5 and subtract to get 17÷5."

Write the following example on the chalkboard.

$$\begin{aligned}\frac{17}{5} = \frac{20-3}{5} &= \frac{20}{5} - \frac{3}{5}\\ &= 4 - \frac{3}{5}\\ &= 3\frac{2}{5}\end{aligned}$$

"Since 17 = 10+7 we can divide the 10 by 5 and the 7 by 5 and then add to get 17÷5."

Write the following example on the chalkboard.

$$\begin{aligned}17\div5= \frac{10+7}{5} &= \frac{10}{5} + \frac{7}{5}\\ &= 2 + 1\frac{2}{5}\\ &= 3\frac{2}{5}\end{aligned}$$

Repeat this procedure using other division examples.

P.O. 4.05.01.01

NAME:____ CLASS:__________ DATE:_______

Write YES if you can do division and give the quotient. Write NO if the division is impossible.

1. $\begin{array}{r}2\\6\overline{)12}\end{array}$

Yes

2. $0\overline{)3}$

3. $7\overline{)21}$

4. $8\overline{)16}$

5. $0\overline{)9}$

6. $9\overline{)81}$

7. $0\overline{)2}$

8. $0\overline{)0}$

9. $5\overline{)25}$

10. $0\overline{)11}$

11. $9\overline{)81}$

12 $3\overline{)18}$

13 $0\overline{)20}$

14. $2\overline{)14}$

15. $0\overline{)49}$

P.O. 4.05.01.02

NAME:______________________________CLASS:__________DATE:________

I. Give the quotients and the related multiplication sentence.

II. Complete the rule.

Ⓘ $0 \div 8 = 0$ $0 \times 8 = 0$	$3\overline{)0} =$	$4\overline{)0} =$
$0 \div 7 =$	$0 \div 10 =$	$6\overline{)0} =$
$0 \div 12$	$11\overline{)0} =$	$1\overline{)0} =$

(II) Complete the rule.

If 0 is divided by an number (except 0), the quotient is ____.

P.O. 4.05.01.03

NAME:____________________________________ **CLASS:**__________ **DATE:**________

I. Find each quotient. If the example can't be done cross it out.

II. Complete each rule.

I. 1. $1\overline{)10}$ 2. $0\overline{)10}$ 3. $10\overline{)0}$

4. $1\overline{)18}$ 5. $0\overline{)18}$ 6. $18\overline{)0}$

7. $1\overline{)7}$ 8. $1\overline{)11}$ 9. $1\overline{)13}$

10. $1\overline{)15}$ 11. $1\overline{)20}$ 12. $1\overline{)17}$

II. Complete each rule

1. If the divisor is 1 the quotient is the same as the______________.

2. If the dividend is 0 the quotient will be________________.

P.O. 4.05.01.04

NAME:______________________________ CLASS:________ DATE:_______

Find the quotient. Check using multiplication.

1. 7)21 check 7 x 3 = 21	2. 56 ÷ 7 = check __ x __	3. 9)36 check __ x __
4. 63 ÷ 7 = check __ x __	5. $\frac{18}{6}$ = check __ x __	6. $\frac{25}{5}$ = check __ x __
7. 9)81 check __ x __	8. 2)20 check __ x ____	9. 7)21 check __ x __
10. 4)28 check __ x __	11. $\frac{49}{7}$ = check __ x __	12. 3)9 check __ x __

P.O.: 4.05.01.05

NAME:____ CLASS:__________ DATE:________

Use the distributive property to solve the division examples.

1.

$49 - 8 = \frac{48 + 1}{8} = \frac{48}{8} + \frac{1}{8} =$

$6 + \frac{1}{8} = 6\frac{1}{8}$

2. $25 - 4 = \frac{24 +}{4} =$

3. $23 - 3 = \frac{-}{3} =$

4. $33 - 5 = \frac{+}{5} =$

5. $45 - 7 = \frac{+}{7} =$

6. $39 - 6 = \frac{+}{6} =$

7. $13 - 2 = \frac{+}{2} =$

8. $59 - 9 = \frac{+}{9} =$

9. $40 - 7 = \frac{-}{7} =$

10. $44 - 5 = \frac{[illegible] - [illegible]}{5} =$

Unit 18

4.05.02 DIVISION OF A 2- AND 3-DIGIT DIVIDEND BY A 1-DIGIT DIVISOR WITHOUT REGROUPING

(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

4.05.02.01B divide a 1-digit number into a 2 digit and 3-digit number without regrouping using the distributive property of division over addition;

e.g.,

36 = 3 tens + 6 ones

$3\overline{)3 \text{ tens} + 6 \text{ ones}}$

$\begin{array}{l} \underline{\;1 \text{ ten} \;\; + 2 \text{ ones}} \\ 3\overline{)3 \text{ tens} + 6 \text{ ones}} \end{array}$ 1 ten + 2 ones = 10 + 2 = 12

$3\overline{)36}$

4.05.02.02B divide a 1-digit number into a 2 through 3-digit number without regrouping using repeated subtraction;

e.g.,

$$\begin{array}{rr} & 322 \\ & 3\overline{)966} \\ 300 \times 3 \longrightarrow & \underline{-900} \\ & 66 \\ 20 \times 3 \longrightarrow & \underline{-60} \\ & 6 \\ & \underline{-6} \\ & 0 \end{array}$$

4.05.02.03B

use zero as a placeholder in a quotient;
e.g.,

$$918 \div 9 = 102 \qquad \begin{array}{r} 102 \\ 9\overline{)918} \end{array}$$

4.05.02.04B

solve word problems related to skills learned in this module.
e.g.,

There are 36 children in a class. Only groups of 3 children can go to the reading class at a time. How many groups can go for everyone to have a turn?

$$\begin{array}{rr} & 12 \\ & 3\overline{)36} \\ 10 \times 3 \longrightarrow & \underline{-30} \\ & 6 \\ 2 \times 3 \longrightarrow & \underline{-6} \\ & 0 \end{array} \qquad\qquad \begin{array}{r} \underline{\text{check}} \\ 12 \\ \underline{\times 3} \\ 36 \end{array}$$

4.05.02

VOCABULARY

TERMS

divisor
dividend
quotient

GETTING STARTED

Review the basic division facts with the students. Rexo the following facts. Time the students. Say, "You will be given four minutes to do this." Ask students to raise their hands as they finish. Have the students exchange papers and check the answers. Students who finish before four minutes and get all the facts correct should be given the title of "Grand Masters of Division Facts."

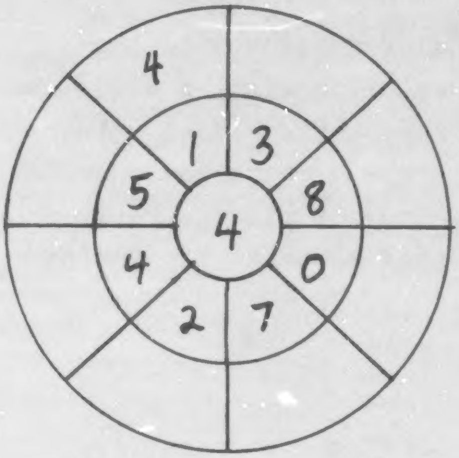
	a	b	c	d	e	f	g	h
1.	1)1	1)3	1)5	1)4	1)6	1)9	1)8	1)2
2.	2)18	2)10	2)12	2)16	2)8	2)6	2)4	2)2
3.	3)27	3)6	3)9	3)12	3)24	3)18	3)30	3)21
4.	4)80	4)28	4)40	4)12	4)32	4)24	4)36	4)16
5.	5)30	5)45	5)20	5)10	5)25	5)15	5)40	5)35
6.	6)30	6)24	6)42	6)6	6)12	6)36	6)54	6)18
7.	7)7	7)21	7)14	7)56	7)49	7)42	7)35	7)28
8.	8)16	8)0	8)56	8)72	8)48	8)32	8)24	8)64
9.	9)45	9)27	9)36	9)63	9)9	9)81	9)0	9)18

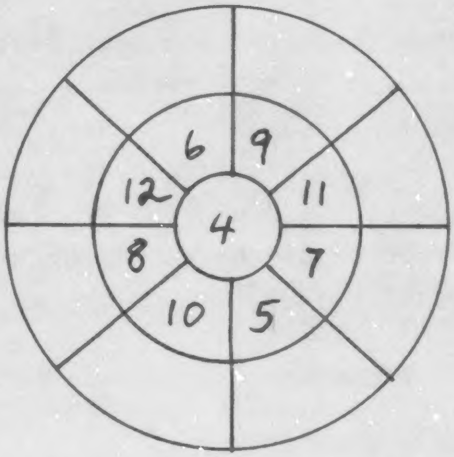
4.05.02

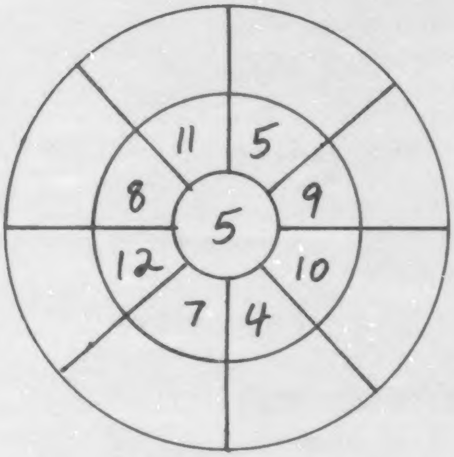
GETTING STARTED cont'd

Prepare a ditto master sheet similar to the division fact sheet.

Directions: Find the products.


4
1
3
5
8
4
4
0
2
7


6
9
12
11
4
8
7
10
5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12
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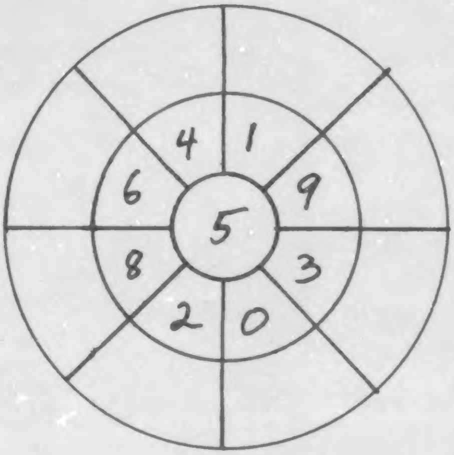
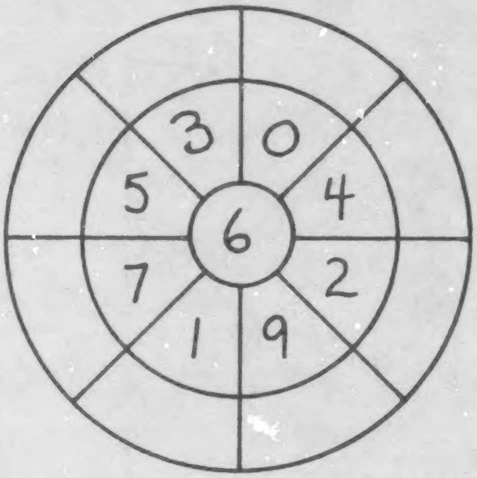
4



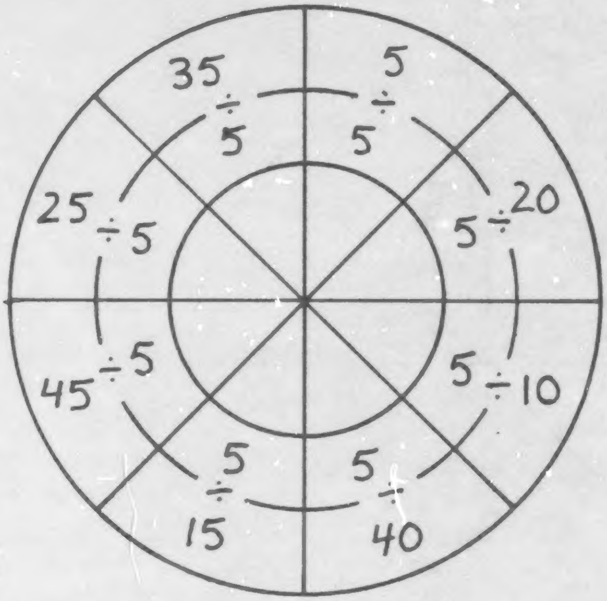
4.05.02

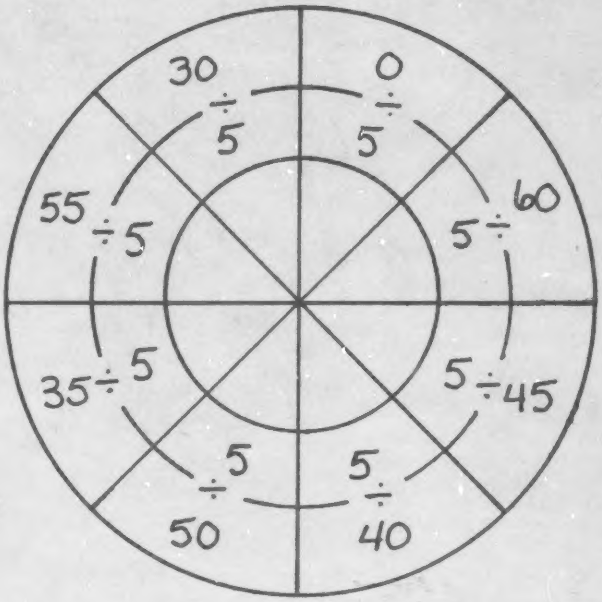
GETTING STARTED cont'd

Find the products.



Find the quotients.

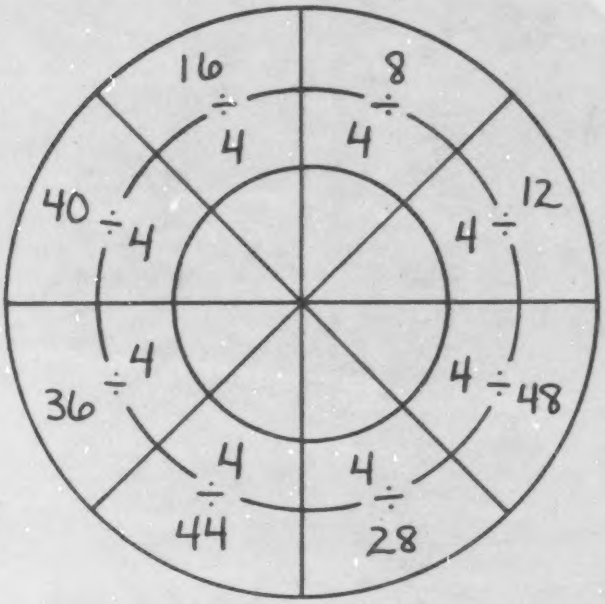

35 ÷ 5
5 ÷ 5
25 ÷ 5
5 ÷ 20
45 ÷ 5
5 ÷ 10
5 ÷ 15
5 ÷ 40

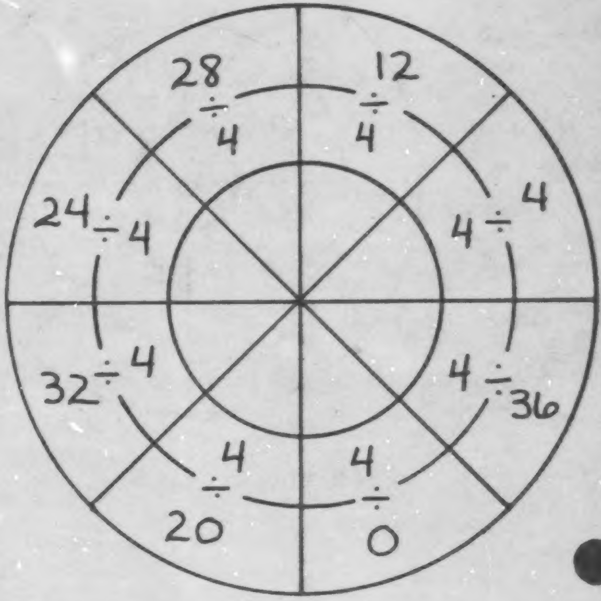

30 ÷ 5
0 ÷ 5
55 ÷ 5
5 ÷ 60
35 ÷ 5
5 ÷ 45
5 ÷ 50
5 ÷ 40

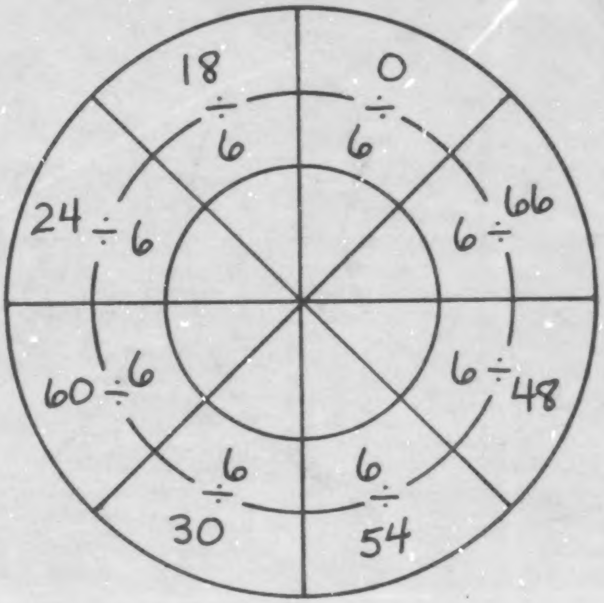
4.05.02

GETTING STARTED cont'd

II Find the quotients.


16 ÷ 4
8 ÷ 4
12 ÷ 4
48 ÷ 4
28 ÷ 4
44 ÷ 4
36 ÷ 4
40 ÷ 4


28 ÷ 4
12 ÷ 4
4 ÷ 4
36 ÷ 4
0 ÷ 4
20 ÷ 4
32 ÷ 4
24 ÷ 4


18 ÷ 6
0 ÷ 6
66 ÷ 6
48 ÷ 6
54 ÷ 6
30 ÷ 6
60 ÷ 6
24 ÷ 6

4.05.02

4.05.02.01 **divide a 1-digit number into a 2-digit and 3-digit number without regrouping using the distributive property of division over addition**

STRATEGY 1: Write:

$$3\overline{)\,6\;9}$$

Ask students to write 69 in expanded form.
e.g.,
69 = 60 + 9 or 6 tens and 9 ones.

Say, "69 is called the dividend, and the number 3 in the division example is called the divisor."

Rewrite the following problem on the chalkboard.

$$3\overline{)\,6\text{ tens} + 9\text{ ones}}$$

"How many 3's are in 6 tens?" Elicit the response, 2 tens. We place the answer above the problem.
e.g.,

$$\begin{array}{l} \;\;\,2\text{ tens} \\ 3\overline{)\,6\text{ tens} + 9\text{ ones}} \end{array}$$

"How many 3's in 9 ones?" Elicit response, 3 ones. Record your answer over the 9 ones.
e.g.,

$$\begin{array}{l} \;\;\,2\text{ tens} + 3\text{ ones} \\ 3\overline{)\,6\text{ tens} + 9\text{ ones}} \end{array}$$

"The answer in a division problem is called the quotient. What is the quotient for this problem?" Elicit the response, 2 tens + 3 ones.
"What is the value of 2 tens + 3 ones?" (23.)

Repeat this procedure using other examples.

STRATEGY 2: Distribute squared materials to students. Give each student six ten-strips and 9 ones. Ask students, "What number do you have?" (69.)

4.05.02

STRATEGY 2: cont'd

Write the following example on the chalkboard.

$3\overline{)6\ 9}$

Ask a student to explain the example. Elicit from the students that we want to divide 69 into 3 equal groups or we want to know how many sets of 3 are in 69. Let students experiment with the squared material. Say, "How many in each group?" Elicit the response 23. "How was the answer arrived at?" Elicit the response we separated the tens into 3 groups and then separated the ones. Show the example on the chalkboard.

$$\begin{array}{r} 2 \text{ tens} + 3 \text{ ones} = 23 \\ 3\overline{)\ 6 \text{ tens} + 9 \text{ ones}} \end{array}$$

Repeat the procedure using the squared materials to show other examples.

4.05.02.02 **divide a 1-digit number into a 2-digit number through 3-digit number without regrouping using repeated subtraction**

STRATEGY 1: Write the following example on the chalkboard.

$3\overline{)\ 69}$

Say, "We want to know how many threes are in 69. How can we find the answer by using subtraction?" Place 69 disks on a feltboard. Demonstrate how we might solve this problem. Elicit from students that we keep taking away groups of 3 until there are none left. Then we count to see how many groups of 3 we have altogether. Say, "I am going to show you an easier way of solving the problem using a system of subtraction and recording your

STRATEGY 1: cont'd

answers." Refer to the example on chalkboard. "We will work with the digit in the tens column first." "How many groups of 3's are there in 6 tens?" (2.) Record your answer on the top.

e.g.,

$$\begin{array}{rl} & t\ o \\ & \underline{2} \\ 3 &)6\ 9 \end{array}$$

Multiply your answer by the divisor to make sure we have used as many 3's as possible and subtracted the answer from the dividend.

e.g.,

$$\begin{array}{lrl} & & t\ o \\ & & \underline{2} \\ & 3 &)6\ 9 \\ 2x3 = & - & \underline{6} \\ & & 0 \end{array}$$

Repeat the procedure for the digit in the ones column.

e.g.,

$$\begin{array}{lrl} & & t\ o \\ & & \underline{2\ 3} \\ & 3 &)6\ 9 \\ 2x3 = & - & \underline{6\ 0} \\ & & 9 \\ 3x3 = & - & \underline{9} \\ & & 0 \end{array}$$

"The quotient is 23. Repeat the procedure for subtracting and recording your answer using other examples of two and three digit divisions."

STRATEGY 2: Say, "Another way of solving a division problem is through repeated subtraction. The procedure is to keep subtracting a set of items until there are none left."

Write the following example on the chalkboard.

$$2\,\overline{)8\ 6}$$

"We will work on each column separately to subtract as many sets of 2's as possible. How many sets of

STRATEGY 2: cont'd

two are there in 8?" Elicit the response 4. We place the answer on the top.

e.g.,

```
          t   o
          4
       2 )8   6
```

"We now check to make sure that we have used as many 2's as possible in the tens column by multiplying 4x2."

e.g.,

```
          t o
          4
       2 )8 6
 4x2 ->  - 8
           0
```

"We then subtract to make sure there are none left. We now repeat the procedure in the ones column."

e.g.,

```
          t o
          4 3
       2 )8 6
 4x2 ->  - 8 0
           0 6
 3x2 ->  -   6
             0
```

"What is the quotient?" (43.)

Repeat this procedure using other examples with two and three digit dividends.

4.05.02.03 **use zero as a placeholder in a quotient**

STRATEGY 1: Say, "Estimating helps us to make sure our answers make sense. We've used estimation in finding sums, products and differences. We can use a quick way of estimating to make sure our quotients make

STRATEGY 1: cont'd

sense." Write the following example on the chalkboard.

```
3 )615
```

"Before we begin to find the actual answer, we can do two things to help us find out if our answer makes sense. The first thing we should do is find out how many digits will be in the quotient. Can anyone figure out how we can decide how many digits will be in our answer? Elicit the response if we decide which digit in the dividend can be divided by three, then we can figure out how many digits within the quotient."

e.g.,

```
     x x x
   ---------
 3 )6 1 5     3 digits in quotient
```

Repeat this procedure using other examples.

e.g.,

```
     x x x
   ---------
 3 )6 2 7     3 digit quotient
```

"Once we know how many digits in the answer we can estimate the quotient even better. Look at the first example. We know the answer will have 3 digits. We must ask ourselves how many 3's are in 6?" (2.) "Since we know that our quotient will have 3 digits, our quotient will be 2 0 0. We use the zeros as place-holders. Look at example 2. "What is our estimated quotient?" Elicit the response, about 200. "How was the answer arrived at?" Repeat the same procedure using the 3rd example on the chalkboard. Say, "Now let's find the actual quotient." Demonstrate on the chalkboard explaining each step.

e.g.,

```
              h  t  o

              2
            ---------
          3 )6  1  5
2x3 =       - 6
             --------
              0  1
               - 0
```

4.05.02

STRATEGY 1: cont'd

"How many groups of 3's in one?" Elicit the response, none. "How can we show this in the quotient?" Elicit the response by placing a zero above the digit in the tens column.

e.g.,
```
                  h   t   o

                  2   0
               3 )6   1   5
     2x3 =      - 6
                  0   1
     0x3 =          - 0
                      1   5
```

"Are there any groups of 3's in 15?" Elicit the response, yes. "How many groups of 3's in 15?" (5.) "Where should we record the 5?" Ask a student to show the students.

e.g.,
```
                  h   t   o

                  2   0   5
               3 )6   1   5
     2x3 =      - 6
                  0   1
     0x3 =          - 0
                      1   5
     5x3 =          - 1   5
                          0
```

"What is the quotient?" Elicit the response 205. What was our estimated quotient? (200.) "Is our answer close?" (Yes.) "If we had gotten the answer 25 as our actual answer, we would know it was wrong because we had estimated our answer first."

Repeat the procedure using other examples.

STRATEGY 2: Write the following example on the chalkboard.

$4\overline{)816}$

Ask students to begin to solve the problem at their seats as one student does the problem at the chalkboard.

STRATEGY 2: cont'd

e.g.,

```
              h  t  o
              2  0
           4 )8  1  6
   2x4 ->   - 8
              0  1
```

When students get to this step ask, "How many groups of four are there in one?" Elicit the response, none. Say, "Does anyone have any idea of what we should do?" Elicit the response we can add the six ones and figure out how many 4's in 16. "How can we show there were no 4's in one?" Elicit the response by placing a zero above the digit 1. e.g.,

```
              h  t  o
              2  0
           4 )8  1  6
   2x4 ->   - 8
              0  1
   0x1 ->      - 0
                 1  6
   4x4 ->      - 1  6
                    0
```

"What is the quotient? We can check our quotient by multiplying the quotient by the divisor. The product should be the same as the dividend of the division problem."

```
e.g.,       204
            x 4
            816 = dividend
```

Repeat the procedure using these examples.

4.05.02.04 **solve word problems related to skills learned in this module**

STRATEGY 1: Place the following word problems on the chalkboard.

1) There are 24 students in a class. Only groups of 2 students can go to the game corner

STRATEGY 1: cont'd

in the math lab. How many groups can go to the game corner for everyone to have a turn?
2) Ellen has 642 candy eggs. How many baskets can she fill if she puts 2 eggs in each basket?
3) Sue is working in a paper packaging plant. Sue has 216 sheets of paper to pack into 2 boxes. How many sheets of paper should Sue place in each box?

Ask students to read problem 1 on the chalkboard. Say, "What operation should we use?" Elicit the response, we are dividing 24 into groups of 2. Write a number sentence to describe how we should plan to solve this problem, e.g., 24÷2 =___.

Ask a student to go to the chalkboard and show the students how to work the problem out and check the answer.

Repeat this procedure to solve problems 2 and 3.

STRATEGY 2: Say, "What is division?" Elicit that division is separating things into groups. "When reading a word problem we want to always keep the definition of the operations in our minds. Remember what division means as we solve the following problems."

Write the following examples on the chalkboard.

1) Sally has 363 balloons to give to 3 classes for their special parade float. How many balloons will each class get?
2) Mrs. Fine bought 218 popsickle sticks for her classes to use for their art projects. Mrs. Fine has two art classes. How many popsickle sticks will each class have to work with?

Ask students to read the problems on the chalkboard. Say, "What operation would we use to solve the first problem?" Elicit the response,

STRATEGY 2: cont'd

division because we are separating into groups. Write a number sentence to describe how we would solve this problem; e.g., 363÷3 =___. "Let's do the computation on the chalkboard and check our answer." Ask a student to do the problem at the chalkboard and explain all the steps.

e.g.,

```
                  h  t  o

                  1  2  1
                 ________
    1)     3 )3  6  3
   1x3 ->    - 3
               ________
               0  6
   2x3 ->       - 6
                  _____
                  0  3
   1x3 ->          - 3
                     _
                     0
```

check

```
121
x 3
___
363
```

Repeat the procedure to solve problem 2.

P.O. 4.05.02.01

NAME:______________________________ CLASS:________ DATE:______

Directions: Help Little Bo Peep find her sheep. Divide and shade each box that has an answer of 31 to make a path leading to the sheep.

1 6)186	2 4)324	3 5)300	4 4)288
2 5)250	5)155	7)497	6)366
3 9)729	8)248	6)246	5)255
4 9)819	9)279	7)287	3)186
5 2)62	2)842	8)328	6)126
6 7)217	7)77	3)66	2)448
7 6)240	4)124	9)270	8)888

P.O. 4.05.02.02

NAME: ______________________________ CLASS; ________ DATE: ________

There are quotients hidden in this number square. Solve each exercise and find the quotient. Look in rows, colums, and diagonals.

HIDDEN QUOTIENTS

2 0 4 7 9 6 5 3 8 2 1 9 4 7 3
1 8 5 9 4 5 2 1 5 9 3 6 2 6 1
0 7 3 2 3 6 0 7 9 8 3 6 1 4 0
5 6 1 9 8 5 1 2 5 6 4 3 7 2 5
3 7 0 2 8 4 6 7 9 8 3 5 2 1 0
4 4 6 1 9 5 7 2 4 8 6 9 0 4 8
2 1 0 6 8 4 3 7 9 0 4 8 2 5 1
3 4 7 2 1 8 9 0 6 2 1 7 8 9 3
4 5 1 0 9 5 8 4 1 0 3 5 9 8 4
7 6 9 3 8 7 2 5 4 3 8 6 5 7 3
1 0 5 2 7 9 6 4 0 8 9 7 2 1 0
9 5 1 8 5 8 0 7 6 0 2 5 4 1 9
4 9 0 3 2 5 7 4 1 8 0 7 1 9 6
3 8 7 5 4 7 9 0 8 0 5 3 2 4 1
6 1 7 4 0 6 2 9 8 7 4 5 1 6 0

$\begin{array}{r}51\\5\overline{)255}\end{array}$	$9\overline{)810}$	$4\overline{)256}$	$6\overline{)306}$
$2\overline{)128}$	$7\overline{)147}$	$9\overline{)720}$	$3\overline{)183}$

P.O. 4.05.02.03

NAME: ______________________ CLASS; ________ DATE: ________

Find the quotient. Check your answers. Show all work in space provided.

1. $2\overline{)610}$

Work Space

```
        3 0 5
      2)6 1 0
3x2     6
        0 1
0x2       0
          1 0
5x2       1 0
            0
```

Check

```
3 0 5
  x 2
6 1 0
```

Quotient ________

2. $3\overline{)312}$

Quotient ________

3. $4\overline{)416}$

Quotient ________

4. $2\overline{)818}$

Quotient ________

5. $3\overline{)915}$

Quotient ________

P.O. 4.05.02.03 (cont'd)

NAME: ______________________ CLASS; ______ DATE: ______

Find the quotient. Check your answer. Show all work in space provided.

6. $6\overline{)612}$ **Work Space** **Check**

Quotient ________

7. $7\overline{)714}$

Quotient ________

8. $3\overline{)618}$

Quotient ________

P.O. 4.05.02.04

NAME: ______________________________ CLASS; ________ DATE: ________

Solve the following word problems. Write the number sentence used to solve the problem. Show all work. Check all answers.

1. Our troop has 6 patrols with a total of 48 scouts. How many scouts are in each patrol?

Number sentence 48 ÷ 6 = ____

Work Space Check

$6\overline{)48}$

$$\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$$

2. There are 318 ballons. Three friends will share them. How many balloons should each friend get?

Number sentence ____________________

Work Space Check

240

P.O. 4.05.02.04 (cont'd)

NAME:______________________ CLASS;______ DATE:______

Solve the word problems.

3. There were 432 free tickets to the circus to be divided amount 4 schools. How many tickets will each school get?

Number sentence______________________

Work Space Check

4. John has 696 marbles. He wants to put them into three containers. How many marbles will John have in each containers?

Number sentence______________________

Work Space Check

P.O. 4.05.02.04 (cont'd)

NAME: ______________________________ CLASS: ________ DATE: ________

Solve the word problems.

5. Jane has baked 864 cookies, she divided the cookies amount 8 stoves. How many cookies were baked in each stove?

Number sentence ________________________

Work Space Check

6. Jerry and Sam have collected 624 bottle tops. Both of them have collected the same amount. How many bottle tops did Sam collect?

Number sentence ____________________________

Work Space Check

Unit 19

4.05.03 DIVISION OF A 2 AND 3-DIGIT DIVIDEND BY A 1-DIGIT DIVISOR WITH REGROUPING

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.05.03.01A divide a 1-digit number into a 2-digit number regrouping tens as ones using the distributive property;
e.g.,

$$\begin{array}{r} 28 \\ 2\overline{)56} \end{array} \qquad \begin{array}{r} 8 \\ \underline{20} \\ 2\overline{)56} \end{array} = 28$$

4.05.03.02A divide a 1-digit number into a 3-digit number regrouping hundreds as tens and tens as ones using repeated subtraction;
e.g.,

$$\begin{array}{rr} & 264 \\ & 3\overline{)792} \\ 200 \times 3 \longrightarrow & \underline{-600} \\ & 192 \\ 60 \times 3 \longrightarrow & \underline{-180} \\ & 12 \\ 4 \times 3 \longrightarrow & \underline{-12} \\ & 0 \end{array} \qquad \begin{array}{r} \underline{\text{check}} \\ 264 \\ \underline{\times\ 3} \\ 792 \end{array}$$

4.05.03.03A solve word problems using skills learned in this module.

e.g.,

There are 336 jellybeans in a jar. Sue and Jack were to share them equally. How many jellybeans will each person get?

$$\begin{array}{rr} & \underline{168} \\ & 2\overline{)336} \\ 100 \times 2 \longrightarrow & \underline{-200} \\ & 136 \\ 60 \times 2 \longrightarrow & \underline{-120} \\ & 16 \\ 8 \times 2 \longrightarrow & \underline{-16} \\ & 0 \end{array}$$

check

$$\begin{array}{r} 168 \\ \underline{\times\ 2} \\ 336 \end{array}$$

4.05.03

VOCABULARY

GETTING STARTED

Use flash cards to reinforce division facts.

Play Math Baseball using large cards that have problems written on them.

e.g.,

$4\overline{)84}$ $3\overline{)505}$ $3\overline{)963}$

The other cards will have similar problems, all division by one-digit numbers with no regrouping.

Divide the class into two teams.

The team at bat has a batting order. Each time a player correctly answers a problem, he is awarded a "single." If he answers his problem incorrectly, he is "out". After three outs the team is retired. Then, the other team bats.

Use marbles to divide one digit numbers into two-digit numbers without regrouping.

e.g.,

$4\overline{)84}$ $3\overline{)69}$ $2\overline{)28}$

$5\overline{)55}$ $7\overline{)70}$ $6\overline{)66}$

4.05.03

4.05.03.01 **divide a 1-digit number into a 2-digit number regrouping tens as ones using the distributive property**

STRATEGY 1: Distribute squared materials to class (tens and ones). Say, "Lay out 6 tens and 3 ones." Ask students to make as many groups of 3 as possible. Ask, "Are there enough tens to make equal groups?" (Yes.) "How many tens in each group?" (2.) "Are there enough ones to make equal groups?" (Yes.) "How many ones in each group?" (1).

Write the following on the chalkboard.

$$\begin{array}{r} 2\text{ tens} + 1\text{ ones} \\ 3\overline{)\,6\text{ tens} + 3\text{ ones}} \end{array} = \begin{array}{r} 21 \\ 3\overline{)\,63} \end{array}$$

STRATEGY 2: Say, "The teacher received a supply of drawing paper. There were 95 sheets. The teacher wanted to share the paper among 5 students. How many sheets will each student receive? Who can guess how many sheets each student will get? How would we do this problem? If we round to the nearest 10, what would be a good estimate of how many 5's are in 100? Let's do the problem."

Write the following on the chalkboard. $5\overline{)95}$

Say, "In this problem, what does the 9 represent? Does 5 go into 9? Place a small mark over the 9 because that's where we'll place our answer. How many times does 5 go into 9? How many times does 5 go into 90? Place a 10 above in the quotient, starting at our small line. How much is 10 x 5? Let's subtract 50 from 95. How much is left? How many times does 5 go into 45? Place that 9 in the ones column above the 10 in the quotient. How much

STRATEGY 2:
cont'd

is 9 x 5? In our answer, we have 10 + 9. How much does that equal? Is that close to our original estimate? Let's check our answer. Who can tell us how to check our answer? What is 19 x 5?"

e.g.,

```
                      9
                     10         10 + 9 = 19
                   5)95
   10 x 5 ——>       -50
                     45
    9 x 5 ——>       -45
                      0
```

"If we have our original dividend, we are correct."

e.g.,

```
        19
        x5
```

4.05.03

4.05.03.02 **divide a 1-digit number into a 3-digit number regrouping hundreds as tens and tens as ones using repeated subtraction**

STRATEGY 1: Say, "There are 532 students attending the Oaken School. The students are divided into two lunch hours. How many students will go to each lunch period if the principal wants the same number at each lunch hour? Who can guess how many students will be at each lunch period? How can we do this problem? Let's round 532 to the nearest hundred. How many times would 2 go into 500? Let's find out if our estimate is close."

Using squared material (5 hundred boards, 3 ten stips, and 2 units) say, "Let's separate the hundreds into two piles. How many are in each pile? What is the problem? What should we do with the one hundred board that is left over? How many tens strips do we have now? Let's separate the tens strips into the two piles. How many tens strips go into each pile? What is the problem? What should we do with the tens strip that remains? How many ones do we have now? Let's separate 12 into two piles. How many ones go into each pile? How many are in each pile?"

Repeat this problem to show how it will look when solved by repeated subtraction, using the above procedure.

e.g.,

```
                        60
                       200      200 + 60 + 6 = 266
                      ----
                     2)532
 200 x 2 --->         -400
                      ----
                       132
  60 x 2 --->         -120
   6 x 2 --->         - 12
                      ----
                         0
```

4.05.03

STRATEGY 1: cont'd

Ask, "Is our quotient near our original estimate? Let's check our work."

e.g.,

$$\begin{array}{r} 266 \\ \times\ 2 \\ \hline 532 \end{array}$$

STRATEGY 2:

Play, "Stop the Magician" or "Hangman."

e.g.,

Stop The Magician	Hangman
A. Begin the figure and erase body parts as mistakes are made.	A. Begin without figure and fill in body parts as mistakes are made.

Use the following examples to play either game.

$3\overline{)84}$	$6\overline{)72}$	$7\overline{)91}$
$5\overline{)85}$	$8\overline{)96}$	$4\overline{)96}$
$3\overline{)78}$	$2\overline{)96}$	$5\overline{)95}$
$7\overline{)98}$		

Use various examples where there is one regrouping from tens to ones to play either game.

Say, "We can also play this game using related problems.

e.g.,

> There are 532 sheets of paper to be shared equally between Tony and Maria. How many sheets of paper will each one get?"

Say, "Who can guess how many sheets each youngster will receive? How do we solve this problem? What number can we round 532 to? If we divide 2 into 500, what is our answer? Let's see how to do this problem."

STRATEGY 2
cont'd

Write the example 2)532 on the chalkboard.

```
             6
            60
           200   200+60+6=266
         2)532
  200x2= -400
           132
   60x2= -120
            12
    6x2=  -12
             0
```

Say, "What does the 5 stand for in this problem? How many times will 2 go into 5 hundreds? How can we write 2 hundreds? Where will be put 200? What is 200 x 2? Where will we place this 400? How much remains when we subtract?"

"Let's divide 2 into 132. What does the one stand for in 132? How many times does 2 go into 1 hundred? Since 2 cannot go into 1, what will we do with one hundred? If we have 13 tens, how many times does 2 go into 13 tens? How will we write 6 tens? Where will we write 60? What is 60 x 2? Where will we place 120? If I take 120 from 132, how much remains? Where will I place the 12? How many times does 2 go into 12? Where will we put the 6? What is 6 x 2? If we take 12 away from 12, how much remains? Now let's add our quotient. What is our answer? Is it close to our estimate?" e.g.,

```
                        60
                       200      200 + 60 + 6 = 266
                     2)532
200 x 2 ——>           -400
                       132
 60 x 2 ——>           -120
  6 x 2
        ——>           - 12
                         0
```

STRATEGY 2 con't Say, "Let's check the answer by multiplication."
e.g.,

$$\begin{array}{r}266\\ \text{x}\ \ 2\\ \hline 532\end{array}$$

Continue playing "Stop the Magician" or "Hangman" using other examples.

4.05.03.03 **solve word problems using skills learned in this module**

STRATEGY 1: Say, "What is division?" Elicit the response that division is separating a group into equal parts. "When you read word problems, remember the definitions of the four operations. Name the four operations in mathematics." Elicit the response, addition, subtraction, multiplication and division. Place word problems on the chalkboard.
e.g.,

> Danny makes necklaces and bracelets with string and beads. He has 21 centimeters of string. He cuts it into pieces 7 centimeters long. How many pieces will he get?
>
> Danny made 5 plant hangers. It took him 35 hours. How long did it take him to make each hanger?
>
> There were 280 students in the fourth grade going on a trip. There were five buses. How many students were on each bus?

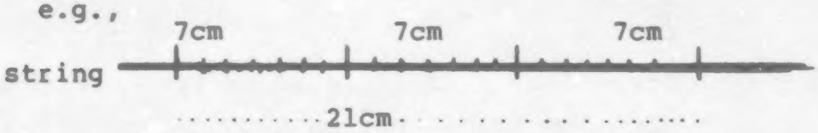
Ask the students to read the first problem.

Say, "When we try to solve word problems, we have to ask ourselves many questions which will help lead us to a solution. We must first read the problem

STRATEGY 1 cont'd

carefully. What information is given in problem number one?" Elicit the response that Danny makes necklaces and bracelets. He has 21 centimeters of string and he cuts the string into pieces 7 centimeters long. "What is the question?" (How many pieces can he cut from the 21 cm string?) "Can we illustrate the problem with a diagram? If we can draw a diagram, it makes it easier for us to understand the problem. Draw a diagram to illustrate the problem." Place the diagram on the chalkboard.

e.g.,



Ask, "Can we restate the problem in a simpler form?" Elicit the response, Danny has a string 21cm long that must be cut into 7cm pieces. "Do we have enough information to solve the problem? After rereading the problem, we should ask ourselves whether the answer will be greater than, less than, or equal to, numbers given. What operation would you choose?" Elicit the response, division. "Write a number that describes how we could solve the problem." ($21 \div 7 = 3$ or $7\overline{)21}$.)

"Does your answer make sense? Can you check your answer?" (Yes, $7 \times 3 = 21$.)

Say, "Read problem 2." Say to the students that they should ask themselves the following questions.

1. What information is given?
2. What is the question?
3. Can we illustrate this problem with a diagram, a chart, or a table?
4. Can we restate the problem in simpler form?

STRATEGY 1
cont'd

5. Can we answer the questions with the given facts?
6. Will the answer be greater than, less than, or equal to, the numbers given?
7. What number operation or operations can be used to answer the question?
8. What number sentence describes how we could solve the problem?
9. Does your answer make sense?
10 How can we check the answer?

"Use the ten questions to help you solve word problems. What operation did you use to solve problem 2?" Ask a student to write the number sentence on the chalkboard. "Solve the number sentence and check your answer."

"Does the answer make sense? Was the question answered?" Ask the students to read and solve problem 3. "What operation should we use?" Write the number sentence on the chalkboard to solve the problem. Review the 10 questions the students should be asking themselves. "Place the answer on the chalkboard and check the answer. Does the answer make sense? Does it answer the question?"

STRATEGY 2: Say, "Division is used to answer two kinds of questions: how many sets and how many in each set." Write the the following example on the chalkboard.

$$2\overline{)64}$$

"What does this mean?" Elicit that it means to separate 64 into 2 equal groups and we want

STRATEGY 2: Cont'd

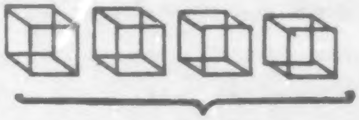
to know how many in each group. It also means to separate 64 into groups of 2 and we want to know how many groups of 2 there are in 64. If we understand what division means, it will make it easier to decide how to solve division word problems." Place some word problems on the chalkboard.

e.g.,

> There are 4 boxes. Each box weighs the same. The total weight of the four boxes is 136 kilograms. How much does each box weigh?

"Remember what division means. Can you draw a diagram to illustrate the problem?" (Yes.) Ask a student to draw a diagram on the chalkboard.

e.g.,



Elicit that we have to separate 136 kilograms into 4 equal parts in order to find how much each box weighs. "Write a number sentence on the chalkboard which describes how to solve the problem." Elicit the number sentence $136 \div 4 = \square$ from the students. "Solve the number sentence. Always ask yourself if the answer makes sense. You should always check your answers and make sure you have answered the question."

Place several other word problems on the chalkboard for the students to solve.

P.O. 4.05.03.01

NAME:______________________ CLASS:__________ DATE:________

Solve & check.

1.

check

$$\begin{array}{rl} & \overset{3}{10} = 10 + 3 = 13 \\ 7\overline{)91} & \\ 10\text{x}7 = & \underline{70} \\ & 21 \\ 3\text{x}7 = & \underline{21} \\ & 0 \end{array} \qquad \begin{array}{r} 13 \\ \underline{\text{x}7} \\ 91 \end{array}$$

2.

check

$3\overline{)87}$

3.

check

$5\overline{)75}$

4.

$8\overline{)96}$

check

5.

check

$4\overline{)68}$

6.

check

$2\overline{)74}$

7.

check

$7\overline{)84}$

8.

$6\overline{)96}$

check

P.O. 4.05.03.02

NAME:______________________________ CLASS:__________ DATE:__________

Solve and Check.

1. 6 80 100 $3\overline{)558}$ 100x3= 300 258 80x3= 240 18 6x3 -18 0 check 100 + 80 + 6 = 186 x3 558	5. check $4\overline{)788}$
2. check $5\overline{)985}$	6. check $6\overline{)756}$
3. check $7\overline{)896}$	7. check $2\overline{)938}$
4. check $3\overline{)861}$	8. check $8\overline{)944}$

P.O. 4.05.03.03

NAME:____________________ CLASS:________ DATE:_______

Read each problem carefully. Write a number sentence you can use to solve the problem. Solve and check your answers.

1. Miguel has a job putting 6 cans in each box. How many boxes will 186 cans fill?

   number sentence 186÷6 = ________
   answer 31 boxes.

2. Hank has a board that is 528 centimeters long. He must cut little pieces of board 4 centimeters long. How many pieces of board will he cut from the long board?

   number sentence________________
   answer______________________

3. How many pupils can ride on 5 school buses if each school bus carries 135 pupils?

   number sentence________________
   answer______________________

4. The same amount of sugar was used in each of 8 batches of candy A total of 168 pounds of sugar was used. How much sugar was in each batch?

   number sentence________________
   answer______________________

5. Mary traveled 192 kilometers in 3 hours. She traveled the same distance each hour. How many kilometers did she travel in one hour.

   number sentence________________
   answer______________________

6. To put two people on Mars the Appollo spaceship has a total weight of 358 pounds. What is the most number of pounds a person could weigh?

   number sentence________________
   answer______________________

7. Five of the engines on the spaceship use 895 gallons of fuel. How many gallons of fuel does one engine use?

   number sentence________________
   answer______________________

8. There are 9 classes in the fourth grade. There are a total of 306 students in the fourth grade. How many students in each class? number sentence________________
   answer______________________

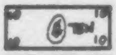
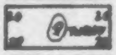
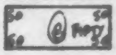
4.10.01 MONEY TO FIFTY DOLLAR BILL

(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

4.10.01.01A recognize and identify ten, twenty and fifty dollar bills, and their equivalent values;
e.g.,

 = ten dollar bill = $10.00 in value.
 = twenty dollar bill = $20.00 in value.
 = fifty dollar bill = $50.00 in value.

4.10.01.02B solve word problems related to skills learned in this module.
e.g.,

Jenny has $50 to spend.
What could she order from the clothing catalogue?

4.10.01

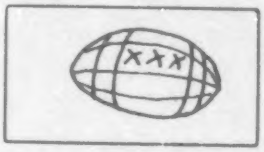
VOCABULARY

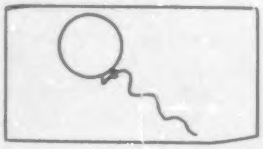
TERMS

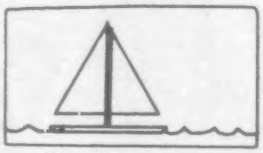
ten dollar bill
twenty dollar bill
fifty dollar bill

GETTING STARTED

Prepare a dozen sheets of oak tag with pictures of toys or other items. Under each picture write the price of each item. e.g.,


$1.75


$ .59


$1.10

Tape these pictures to the chalkboard and say, "Suppose your grandmother gave you a five dollar bill to spend on any of the items shown. Which would you buy?" A student selects the toys he or she prefers. Ask, "How can we be sure that no more than $5.00 will be spent?" Elicit that we can add the cost of each toy selected. Ask a student to write on the chalkboard the price of each toy/item selected. It is then added up to determine the total cost.

Repeat this procedure using other examples.

Distribute play money, or a duplicate sheet with play money that can be cut out, to each student. Show a picture of a toy or game. Say, "This toy costs $7.58." Ask the students to count $7.58 using their play money. Draw the following chart on the chalkboard.

5 5 5 dollar bills	1 1 Dollar Bills	50¢ Half dollars	25¢ Quarters	10¢ Dimes	5¢ Nickels	1¢ Pennies
1	2		2		1	3

$7.58

GETTING STARTED cont'd

Ask a student to tell what combination of bills and coins can be used to obtain $7.58 and record this on the chart. Repeat this procedure having several students record their combinations. Encourage students at their seats to check that the amounts written on the chart do total $7.58.

Explain that there are many ways to express equivalent sums of money. Ask students to make their own chart and find several different ways to total $9.49, $3.83....

4.10.01

4.10.01.01 **recognize and identify ten, twenty and fifty dollar bills and their equivalent values**

STRATEGY 1: Ask, "What kind of bill (paper money) has a value of ten one-dollar bills?" Explain that the ten-dollar bill has the same value as 10 one dollar bills. Display the 10-dollar bill and record the value in two ways.

e.g.,

ten dollars or $10.00

symbol for dollar

no. of pennies
no. of dimes
Decimal point separates the dollars from the coins.

Repeat this procedure for a twenty-dollar bill and for a fifty-dollar bill. Provide the students with play money and have them find ways of making change of a ten-dollar bill, twenty-dollar bill and a fifty-dollar bill.

STRATEGY 2: Prepare play money in dimes, dollar bills, ten-dollar bills, twenty-dollar bills and fifty-dollar bills. Ask one student to be the banker, another student to be the bookkeeper and several other students to be depositors. Give each depositor some dimes and/or some one-dollar bills. The first depositor brings his/her money to the banker to deposit. Have the bookkeeper record the total deposits on a chart.

e.g.,

Dollars		Cents	
tens	ones		

Repeat this procedure for subsequent depositors. Reinforce that ten dimes are eqivalent to one dollar by having the banker exchange dollar bills whenever he/she accumulates ten dimes. The

STRATEGY 2: cont'd

bookkeeper makes the corresponding exchange on the chart. Continue until a total of $10.00 has been deposited. Ask, "What can we exchange for ten one-dollar bills?" Display a picture of a ten-dollar bill. Give each student a play ten-dollar bill.

Repeat this procedure until there is a total of $20.00 in the bank. Ask, "What can the banker exchange for two ten-dollar bills? What can the banker exchange for one ten-dollar bill and ten one-dollar bills?" Display a picture of a twenty-dollar bill. Give each student a play twenty-dollar bill.

Repeat this procedure until there is a total of $50.00 in the bank; e.g., two twenties and a ten, one twenty and three tens, one twenty, two tens and ten one-dollar bills.

4.10.01.02 **solve word problems related to skills learned in this module**

STRATEGY 1: Display the following clothing catalog on the chalkboard.

(Shoes) $18.00	(Suit) $39.00	(Dress) $15.00	(Gloves) $10.00
(Hat) $ 8.00	(Tie) $ 4.00	(Pants) $21.00	(Boots) $31.00
(Belt) $ 7.00	(Shirt) $ 6.00	(Socks) $3.00	(Skirts) $12.00

Display a twenty-dollar bill (play money if you do not have a real bill). Say, "What could I buy with this bill so that I will not get any change?" Allow several students to tell which articles of

STRATEGY 1: cont'd

clothing they selected. Have the student justify his/her choices by adding their costs and obtaining the sum of $20.00.

Ask, "I have fifty dollars to spend. Could I buy a hat, a suit and a tie? Why not?" Elicit that the cost of these items is greater than $50.00 and, therefore, I do not have enough money.

Have the class refer to the catalogue to solve other word problems.

e.g.,

How much change would Ann get if she bought a skirt and socks, and gave the clerk a twenty-dollar bill?

STRATEGY 2:

Prepare several copies of newspaper advertisements from a department store, some play money and a duplicated sheet with several word problems related to the advertisement. Display some of the advertisements on the chalkboard.

e.g.,

Sale!
Boys' sneakers
$5.00 a pair

Special!
Designer Jeans
2 pair for $20.00

Ask, "How much does one pair of designer jeans cost?" Have several students explain how they arrived at their answers. Elicit responses, "I know that ten dollars is half as much as twenty dollars, ten plus ten equals twenty."

Choose one student to act as storekeeper and provide him/her with an assortment of play money and another student to be a customer. Write a word problem related to the advertisements on the chalkboard.

e.g.,

How much change will you receive from a $20.00 bill if you buy 3 pairs of sneakers?

STRATEGY 2: cont'd

Have a student read the question and then let the storekeeper and customer act out the transaction. Ask the customer to explain how he/she knows that he/she received the correct change.

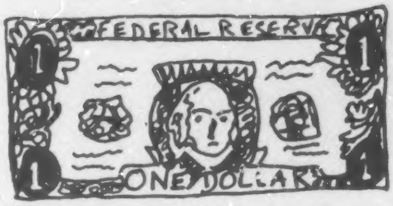
Divide the class into groups. Give each group some play money, a newspaper advertisement, and the worksheet. Have the students solve the word problems by performing the transactons.

P.O. 4.10.01.01

NAME: ______________________ CLASS: ________ DATE: ________

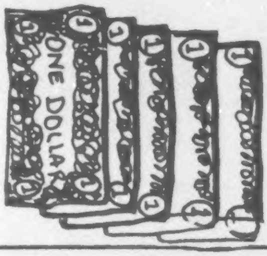
Complete the place value chart in dollars and cents.

1.


FEDERAL RESERVE
1
1
1
1
ONE DOLLAR

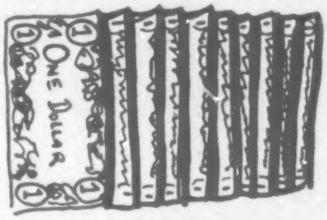
DOLLARS		CENTS	
TENS	ONES	DIMES	PENNIES
	1	. 0	0

2.



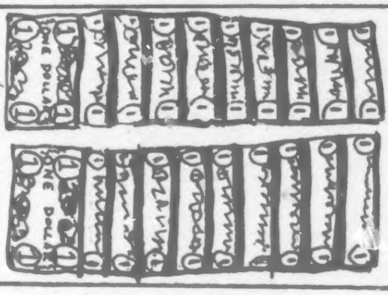
DOLLARS		CENTS	
TENS	ONES	DIMES	PENNIES
	5	. 0	0

3.



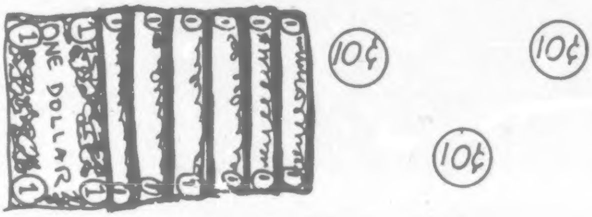
DOLLARS		CENTS	
TENS	ONES	DIMES	PENNIES
		.	

4.



DOLLARS		CENTS	
TENS	ONES	DIMES	PENNIES
		.	

5.


ONE DOLLAR
10¢
10¢
10¢

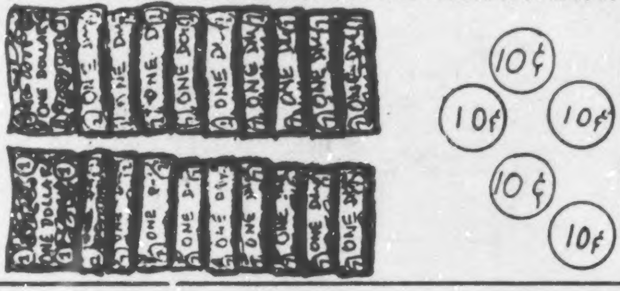
DOLLARS		CENTS	
TENS	ONES	DIMES	PENNIES
		.	

P.O. 4.10.01.01 (cont'd)

NAME: ______________________ CLASS: ________ DATE: ________

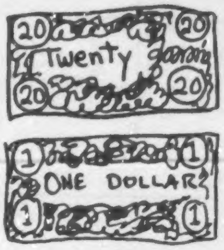
Complete the place value chart in dollars and cents.

6.


ONE DOLLAR
10¢
10¢
10¢
10¢
10¢

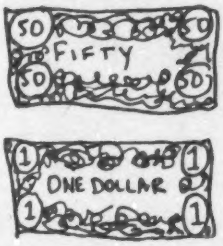
DOLLARS		CENTS	
TENS	ONES	DIMES	PENNIES

7.


20
Twenty
1
ONE DOLLAR

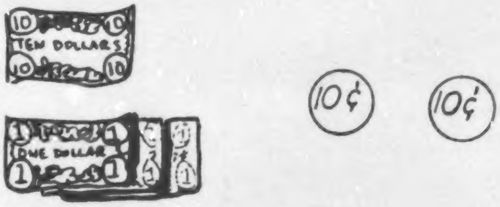
DOLLARS		CENTS	
TENS	ONES	DIMES	PENNIES

8.


50
FIFTY
1
ONE DOLLAR

DOLLARS		CENTS	
TENS	ONES	DIMES	PENNIES

9.


10
TEN DOLLARS
1
ONE DOLLAR
10¢
10¢

DOLLARS		CENTS	
TENS	ONES	DIMES	PENNIES

10.

20
TWENTY
1
ONE DOLLAR

DOLLARS		CENTS	
TENS	ONES	DIMES	PENNIES

P.O. 4.10.01.02

NAME: ______________________________ CLASS: ________ DATE: ______

Use the menu to solve each word problem.

DINNER MENU

Hamburger	$2.20	Steak	$12.00
Cheeseburger	2.50	Veal Cutlet	9.50
Prime Ribs	8.50	Lamb Chops	5.80
Chicken	6.00	Fish	5.00

1. Mr. Greene had a chicken dinner. He paid with a ten dollar bill. How much change did he receive?

$$\begin{array}{r} \$10.00 \\ -6.00 \\ \hline 4.00 \end{array}$$

$4.00

2. Mr. Brooks and his wife went out for dinner. Mr. Brooks had fish. Mrs. Brooks had chicken. What was the total cost of their dinner?

3. What would be the cost of 3 prime rib dinners? ______

4. Mrs. Wilson ordered a veal cutlet dinner. Each of her 2 sons ate a hamburger. What was the total cost of the dinners? __________

5. Ruth paid for her dinner with a ten dollar bill. She received $5.00 in change What did she have for dinner? ____________

6. What would be the cost of a cheeseburger, a lamb chop and a fish dinner? ____________

7. Mr. Robinson paid for his steak dinner with a fifty dollar bill. How much change did he receive? __________

8. What did John and Mary each have for dinner if the total cost of their dinners was $18.00.

4.06.01 EQUIVALENT FRACTIONS

(2-3 lesson)

PERFORMANCE OBJECTIVES

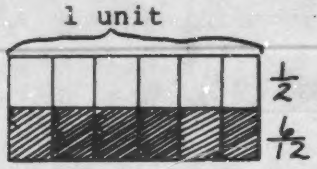
The student will be able to...

4.06.01.01A recognize equivalent fractions;

e.g.,

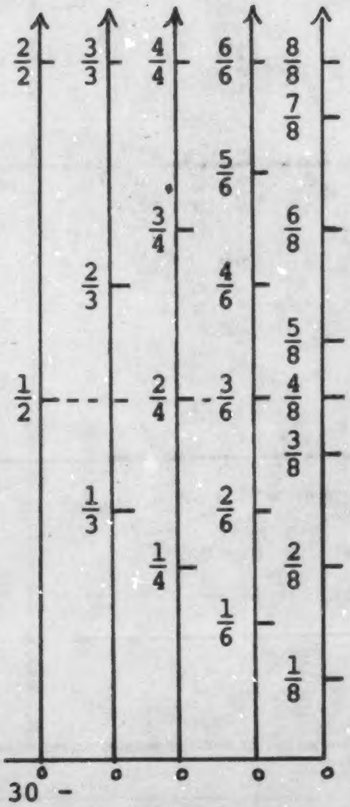
$\frac{1}{2}$ is equivalent to $\frac{6}{12}$

$\frac{1}{2} = \frac{6}{12}$


1 unit
1/2
6/12

4.06.01.02A match a set of equivalent fractions with its corresponding point on the number line;

e.g.,


2/2
1/2
0
3/3
2/3
1/3
0
4/4
3/4
2/4
1/4
0
6/6
5/6
4/6
3/6
2/6
1/6
0
8/8
7/8
6/8
5/8
4/8
3/8
2/8
1/8
0

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4.06.01.03A write fractions equivalent to a given fraction.

e.g.,

Write three fractions equivalent to $\frac{1}{2}$: $\frac{2}{4}$, $\frac{4}{8}$, $\frac{6}{12}$

4.06.01

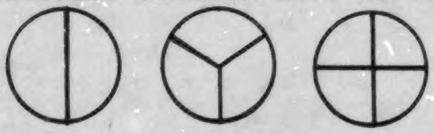
VOCABULARY

TERMS **SYMBOLS**

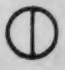
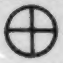
fractions
numerator
denominator
equal parts

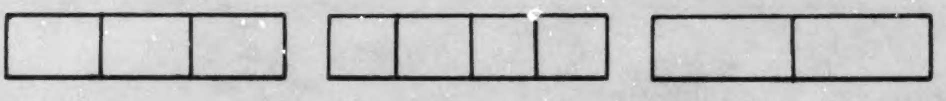
GETTING STARTED

Present equal circles divided into halves, thirds, and fourths.



Write fraction $\frac{2}{3}$ on the chalkboard. Say, "Shade in the parts that show $\frac{2}{3}$ of the circle. How many parts did you shade? (2) How many equal parts in the whole circle?" Elicit the response, "The fraction tells about a part of the whole circle. The top digit, or numerator, tells the number of shaded parts. The bottom digit, or denominator, tells how many equal parts in the whole circle."

Ask the students to shade in other fractional parts, e.g., $\frac{1}{2}$ of , $\frac{3}{4}$ of  .



Say, "I want the biggest piece of candy possible. Should I take $\frac{1}{3}$, $\frac{1}{4}$ or $\frac{1}{2}$ of this candy bar? Let's cut paper to show the sizes and compare." Demonstrate how to divide and cut papers to show $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{1}{2}$. Ask a student to compare cut pieces to find largest. Elicit the response, "The more equal pieces you cut from a candy bar the smaller each piece."

Ask students to use <, > and = to compare candy pieces. e.g., ($\frac{1}{3}$ and $\frac{1}{4}$), ($\frac{1}{2}$ and $\frac{2}{4}$), ($\frac{1}{2}$ and $\frac{1}{3}$).

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4.06.01

4.06.01.01 recognize equivalent fractions

STRATEGY 1: Distribute a sheet of paper to each student. Ask students to fold paper and color one part red. Say, "How many equal parts? (2) How many colored red? (1) What is the fraction? ($\frac{1}{2}$) Now fold paper again. How many equal parts? (4) How many parts are colored red? (2) What is the fraction? ($\frac{2}{4}$) Fold again. How many parts? (8) How many parts are colored red? (4) What is the fraction? ($\frac{4}{8}$) Have you changed the part you colored?" Write the fractions $\frac{1}{2}$, $\frac{2}{4}$, $\frac{4}{8}$ on the chalkboard. Elicit the response, "$\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$. These fractions all describe the same amount."

Repeat this procedure using $\frac{1}{3}$ colored. Are $\frac{1}{3}$, $\frac{2}{6}$ and $\frac{4}{12}$ equal fractions? (Yes)

STRATEGY 2: Give out 12 discs (4 red, 8 blue). Say, "Write a fraction to tell how many discs are red. How many are red? (4) How many in all? (12)" Write the fraction $\frac{4}{12}$. "Now let's put them into groups of 2 keeping the same colors together. How many groups are red? (2) How many groups in all? (6)" Write the fraction $\frac{2}{6}$. Say, "Now let's put them into groups of 4 keeping the same colors together. How many groups are red? (1) How many groups in all? (3) Write the fraction $\frac{1}{3}$. "Have I changed the number of red discs?" Elicit the response, "No, the red discs were not changed but they were regrouped to name the fractions, e.g., $\frac{1}{3} = \frac{2}{6} = \frac{4}{12}$.

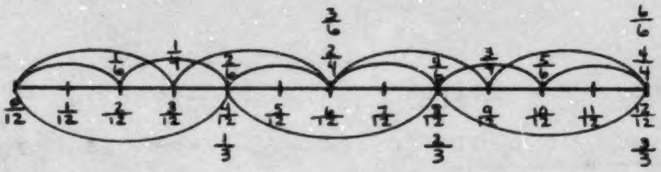
Repeat this procedure using 6 red and 6 blue to show $\frac{6}{12} = \frac{3}{6} = \frac{1}{2}$.

4.06.01

4.06.01.02 **match a set of equivalent fractions with its corresponding point on the number line**

STRATEGY 1: Say, "Draw a line and separate it into 12 equal parts. "How many equal parts?" (12) "Mark the line into twelfths."

e.g.,



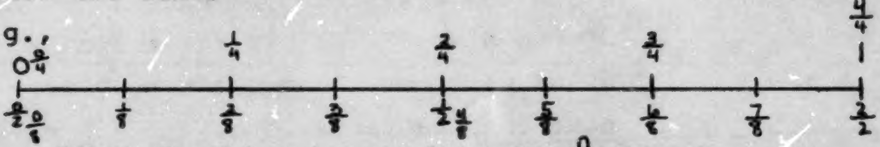
Ask students to group into sets of 3. Say, "How many equal parts?" (4) "Mark the line into fourths. Group into sets of 4. How many equal sets?" (3) "Mark the line into thirds. Group into sets of 2. How many equal sets?" (6) "Mark the line into sixths. Look at the $\frac{3}{6}$, $\frac{2}{4}$ and $\frac{6}{12}$. They all name the same point on the number line. What does this tell you about these fractions?" Elicit the response, "The fractions are equivalent."

Ask students to name other fractions on the line that measure the same point.

e.g., $\frac{4}{6} = ?$, $\frac{1}{4} = ?$

STRATEGY 2: Ask student to draw a number line from 0 to 1. Separate it into 2 equal parts and label the parts below the line.

e.g.,



Say, "What fraction is equal to 0? ($\frac{0}{2}$) What fraction is equal to 1? ($\frac{2}{2}$)" Elicit the response that a point on the number line can have different names but the values are equivalents. Say, "Divide each part again. How many equal parts? (4) Label it into fourths above the line. Divide each

4.06.01

STRATEGY 2: cont'd

part again. How many equal parts? (8) Label it into eighths below the line. What other names can I use for $\frac{2}{4}$? How does the number line show that they are equal?" Elicit the response, fractions that line up at the same point are equal.

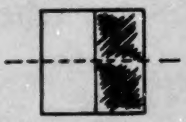
e.g., $\frac{2}{4} = \frac{1}{2} = \frac{4}{8}$.

Ask students to list equivalent fractions for $\frac{3}{4}$, $\frac{0}{4}$, $\frac{2}{8}$ and $\frac{4}{4}$ using the number line.

4.06.01.03 **write fractions equivalent to a given fraction**

STRATEGY 1: Draw a square on the chalkboard. Draw a vertical line to divide it into 2 equal parts. Shade one part. Ask, "How many parts in all? (2) How many shaded? (1)" Write the fraction $\frac{1}{2}$. Draw a horizontal line (as shown). "How many equal parts? (4) How many shaded? (2)" Write the fraction.

e.g.,

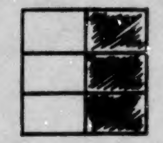


$$\begin{tikzcd} \frac{1}{2} \arrow[r, bend left, "\times 2"] \arrow[r, bend right, "\times 2"'] & \frac{2}{4} \end{tikzcd}$$

Ask, "What have I done to the parts when I draw the horizontal line?" Elicit the response, "There are 2 times as many shaded parts and 2 times as many parts in all. The numerator and denominator were multiplied by 2."

Repeat the procedure and divide the square into thirds using 2 horizontal lines. Elicit the response there are now 3 times as many parts, stressing multiplication by 3 of both the numerator and denominator.

e.g.,



$$\begin{tikzcd} \frac{1}{2} \arrow[r, bend left, "\times 3"] \arrow[r, bend right, "\times 3"'] & \frac{3}{6} \end{tikzcd}$$

4.06.01

STRATEGY 1: cont'd

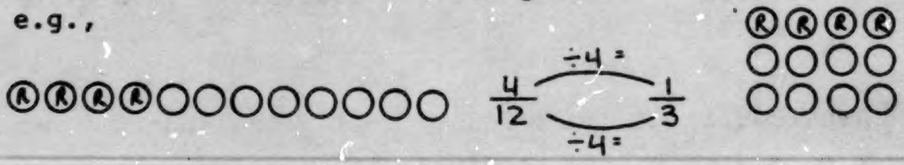
Ask students to find equivalent fractions $\frac{1}{2}$ by creating 4 times as many parts ($\frac{4}{8}$), 5 times, 6 times.

Find equivalent fractions for $\frac{1}{3}$, $\frac{2}{5}$, ...

STRATEGY 2:

Draw 12 circles. Color 4 red. Ask, "How many circles in all? (12) How many are red? (4)" Write the fraction $\frac{4}{12}$. "Let's arrange these circles into groups of 4 keeping the same colors together. How many groups of red circles? (1) How many groups in all? (3)" Write the fraction $\frac{1}{3}$.

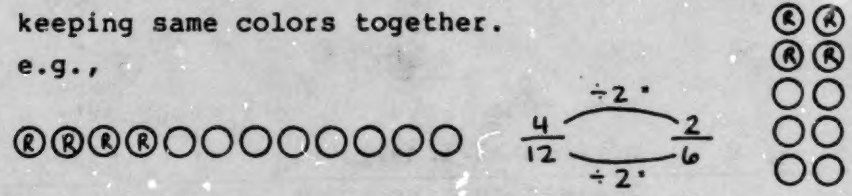
e.g.,



Ask, "What did I do when I arranged the circles into groups of 4?" Elicit the response, "You regrouped them and divided them by 4. You divided both numerator and denominator by 4."

Repeat this procedure and regroup into groups of 2 keeping same colors together.

e.g.,



Elicit the response, "Both the numerator and denominator were divided by 2."

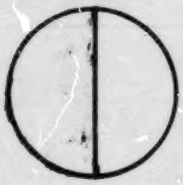
Ask student to find equivalent fractions for $\frac{8}{12}$ by dividing by 4, dividing by 2.

Find equivalent fractions for $\frac{6}{12}$, $\frac{5}{10}$, $\frac{6}{9}$ ... by dividing numerator and denominator by same number.

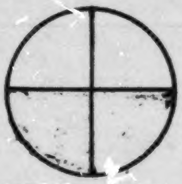
P.O. 4.06.01.01

NAME: ______ CLASS: ______ DATE: ______

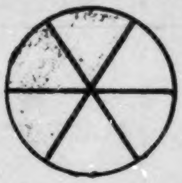
1. Name the shaded fraction.
2. Cut out the cards to play Match Game.
3. Place cards face down.
4. Pick two cards; if they are equivalent fractions you keep the cards and try again.
5. If they are not equivalent fractions turn the cards back and the other player goes.
6. The player with the most cards is the winner.



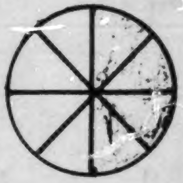
$\frac{\quad}{2}$



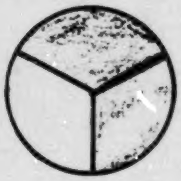
$\frac{2}{\quad}$



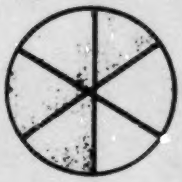
$\frac{\quad}{\quad}$



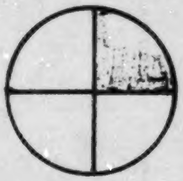
$\frac{\quad}{8}$



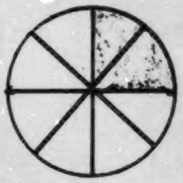
$\frac{2}{\quad}$



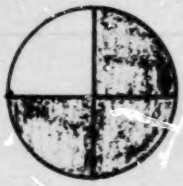
$\frac{\quad}{\quad}$



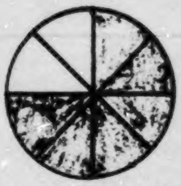
$\frac{\quad}{\quad}$



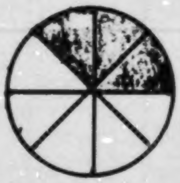
$\frac{\quad}{8}$



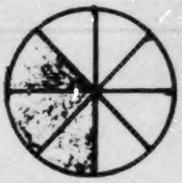
$\frac{\quad}{4}$



$\frac{\quad}{\quad}$



$\frac{3}{\quad}$

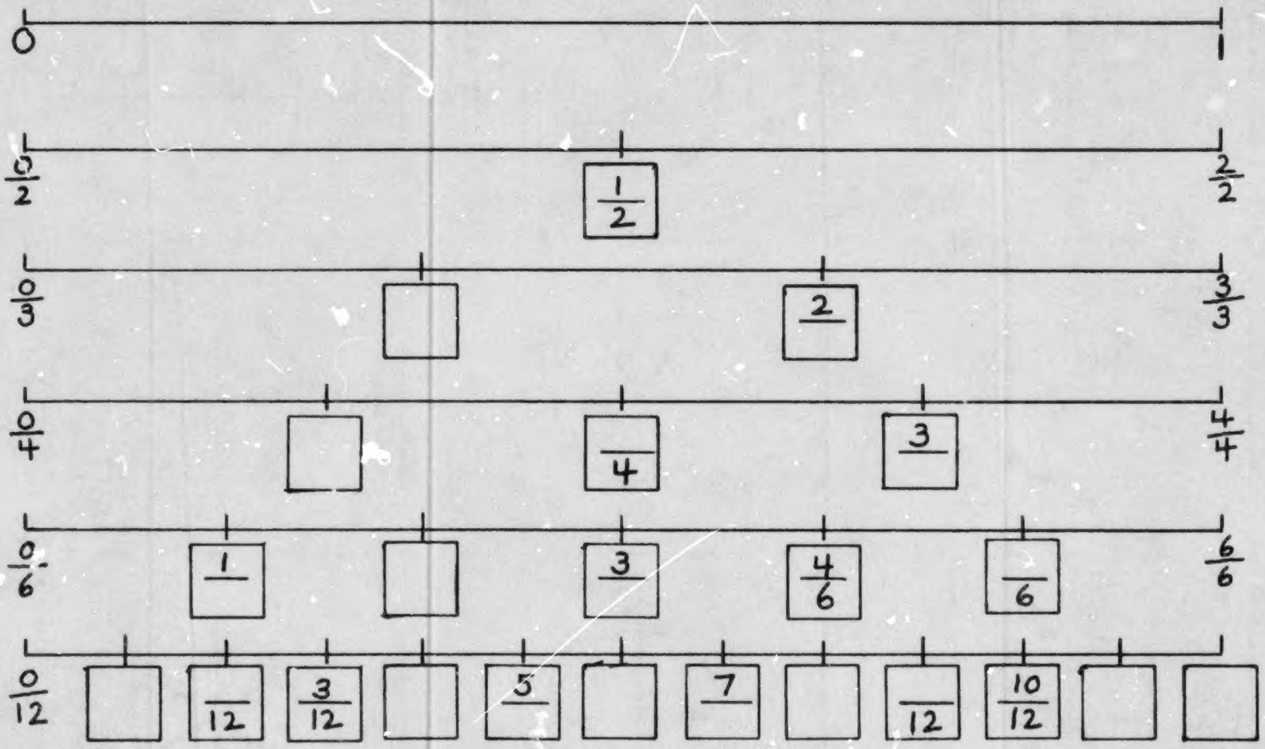


$\frac{\quad}{\quad}$

P.O. 4.06.01.02

NAME: ______________________ **CLASS:** ________ **DATE:** ________

Fill in the missing points on each number line. Use the lines to find the equivalent fractions.



0
1
0/2
1/2
2/2
0/3
2
3/3
0/4
4
3
4/4
0/6
1
3
4/6
6
6/6
0/12
12
3/12
5
7
12
10/12

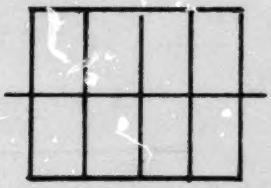
$\frac{1}{2} = \frac{\ }{4}$ | $\frac{3}{6} = \frac{\ }{12}$ | $\frac{6}{6} = \frac{\ }{4}$ | $\frac{3}{4} = \frac{\ }{12}$ | $\frac{1}{6} = \frac{2}{\ }$ | $\frac{1}{3} = \frac{4}{\ }$

$\frac{3}{12} = \frac{\ }{4}$ | $\frac{2}{\ } = \frac{4}{6}$ | $\frac{0}{12} = \frac{\ }{6}$ | $\frac{2}{2} = \frac{1}{\ }$ | $\frac{\ }{6} = \frac{10}{12}$ | $\frac{2}{6} = \frac{4}{\ }$

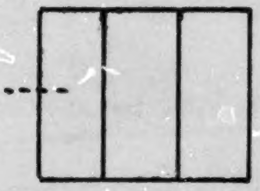
P.O. 4.06.01.03

NAME: ______________________ CLASS: ________ DATE: ______

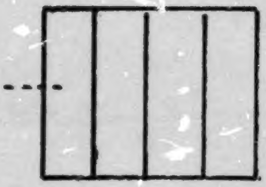
A. Draw a horizontal line to make an equivalent fraction.



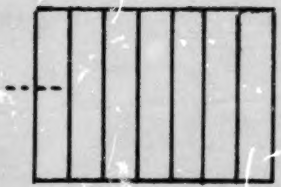
$\frac{1}{4} = \frac{2}{8}$



$\frac{2}{3} =$

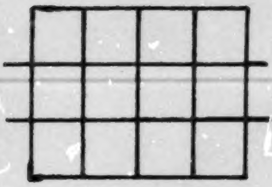


$\frac{2}{4} =$

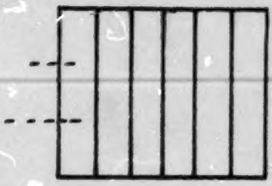


$\frac{3}{7} =$

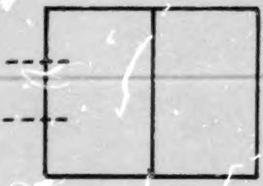
B. Draw two horizontal lines to make an equivalent fraction.



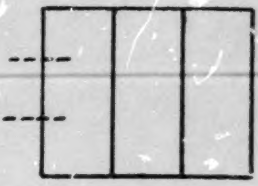
$\frac{1}{4} = \frac{3}{12}$



$\frac{2}{6} =$



$\frac{1}{2} =$



$\frac{2}{3} =$

C. Use multiplication of both numerator and denominator.

×2
$\frac{4}{6} = \frac{8}{\quad}$
×2

×3
$\frac{2}{3} = \frac{\quad}{9}$
×3

×2
$\frac{5}{10} = \frac{\quad}{\quad}$
×2

×
$\frac{4}{5} = \frac{12}{\quad}$
×

D. Use division of both numerator and denominator to make an equivalent fraction.

÷2
$\frac{8}{16} = \frac{4}{\quad}$
÷2

÷5
$\frac{15}{20} = \frac{\quad}{4}$
÷5

÷2
$\frac{12}{16} = \frac{\quad}{\quad}$
÷2

÷
$\frac{9}{12} = \frac{3}{\quad}$
÷

Unit 22

4.06.02 ORDER OF UNIT FRACTIONS

(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

4.06.02.01A order numerically 3 fractions: smallest, middle, largest;

e.g.,

$\frac{1}{3}, \frac{1}{2}, \frac{1}{4}$ unordered

$\frac{1}{4}, \frac{1}{3}, \frac{1}{2}$ ordered

4.06.02.02A order numerically 3 fractions from smallest to largest or largest to smallest.

e.g.,

$\frac{1}{5}, \frac{1}{2}, \frac{1}{3}$ unordered

$\frac{1}{5} < \frac{1}{3} < \frac{1}{2}$ ordered

$\frac{1}{3}, \frac{1}{2}, \frac{1}{5}$ unordered

$\frac{1}{2} > \frac{1}{3} > \frac{1}{5}$ ordered

4.06.02

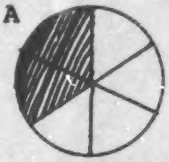
VOCABULARY

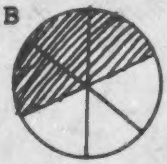
TERMS	SYMBOLS
greater than	>
less than	<
fraction	
numerator	
denominator	
order	

GETTING STARTED

Draw a pair of circles divided into six equal regions on the chalkboard.

Shade two regions of circle A and three of circle B.


A

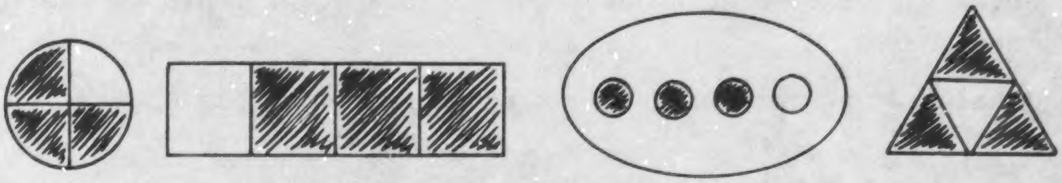

B

Say, "Here are two circles. Part of each is shaded. What part of circle A is shaded?" Elicit the response that $\frac{2}{6}$ of circle A is shaded. Ask, "How do we write $\frac{2}{6}$?" Ask a pupil to write $\frac{2}{6}$. Ask, "How can we tell that $\frac{2}{6}$ of the circle is shaded?" Elicit the response that the circle is divided into six equal parts and two of these parts are shaded. Repeat this procedure for circle B. Ask, "Which fraction is larger $\frac{2}{6}$ or $\frac{3}{6}$?" Elicit the response that $\frac{3}{6}$ is larger. Ask, "How can we tell that $\frac{3}{6}$ is larger?" Elicit the response that both regions are the same size. Each is divided into six parts or sixths. Three sixths is more than two sixths because three parts is more than two parts. Repeat this procedure for other regional pairs.
e.g., $\frac{1}{3}$ and $\frac{2}{3}$, $\frac{1}{4}$ and $\frac{3}{4}$, $\frac{5}{8}$ and $\frac{2}{8}$, $\frac{1}{12}$ and $\frac{7}{12}$, $\frac{3}{4}$ and $\frac{2}{4}$, $\frac{11}{12}$ and $\frac{7}{12}$

4.06.02

GETTING STARTED cont'd

Write the fraction $\frac{3}{4}$ on the chalkboard. Ask the pupils to identify the fraction. Elicit the response that the fraction is three-fourths. Ask, "Which part of the $\frac{3}{4}$ is the numerator?" Elicit the response that the 3 is the numerator. Ask "Which part of the $\frac{3}{4}$ is the denominator?" Elicit the response that the 4 is the denominator. Ask, "Can you draw a diagram for $\frac{3}{4}$?" Elicit the following diagrams.

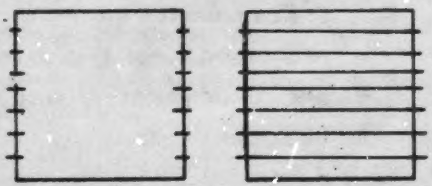


Repeat this procedure for other fractions.
e.g., $\frac{2}{3}$, $\frac{5}{6}$, $\frac{7}{8}$, $\frac{3}{8}$, $\frac{5}{12}$, $\frac{1}{16}$, $\frac{1}{4}$, $\frac{4}{6}$.

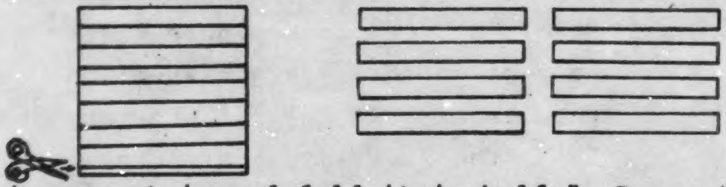
4.06.02

4.06.02.01 order numerically 3 fractions: smallest, middle, largest

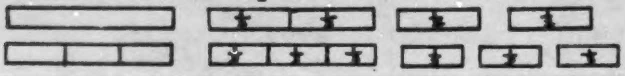
STRATEGY 1: Distribute a sheet of construction paper, scissors and a ruler to each pupil. Ask the pupils to draw lines which are spaced one inch apart. Demonstrate how to connect the marks to form straight lines across the paper.



Say, "Cut away the small $\frac{1}{2}$" piece of paper which remains at the bottom margin." Demonstrate how to cut away the portion of paper. "Cut along the lines to form eight strips."



"Take one strip and fold it in half." Demonstrate how to fold the strip. "Write $\frac{1}{2}$ on each half." Demonstrate how to write $\frac{1}{2}$. "Tear the strip along the fold so that there are two pieces each with $\frac{1}{2}$ written on it." Repeat this procedure to make fractional parts for $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{3}$, $\frac{1}{6}$, $\frac{1}{12}$, $\frac{1}{16}$ Label the last piece "1".



"How many different pieces do you have?" Elicit the response, there are eight different pieces.

STRATEGY 1 cont'd

"Put the whole (the piece with the "1") aside for awhile. Can you find the largest piece?" Elicit the response, $\frac{1}{2}$ is the largest piece. "Place the fractions in order from the smallest to the largest. What do you notice about the numerators of all the fractions?" Elicit the response, the numerators are all the same. They are all one. "What do you notice about the denominators as the fractional pieces get larger?" Elicit the response, as the piece gets larger the numeral in the denominator gets smaller. "Why do you think that this is true?" Elicit the response, the number in the denominator tells how many equal parts the whole is divided into. As the number gets larger it means the single strip of paper was divided into more pieces. "How many pieces did you get when you divided the strip into sixths?" Elicit the response, there were six pieces. "How many pieces did you get when you divided the strip into twelfths?" Elicit the response, there were 12. "The same amount of material had to be shared among 12 parts as was shared among 6. To make 12 parts each part had to be smaller. Compare other pairs of pieces, e.g.,
$\frac{1}{2}$ and $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{1}{8}$, $\frac{1}{12}$ and $\frac{1}{3}$, $\frac{1}{12}$ and $\frac{1}{8}$, $\frac{1}{12}$ and $\frac{1}{2}$.

STRATEGY 2:

Distribute the fractional pieces made in the previous strategy. Write three unit fractions on the chalkboard, e.g. $\frac{1}{3}$, $\frac{1}{2}$, $\frac{1}{4}$. Say, "Here are three unit fractions. We will use our fractional pieces to put them in order numerically from the smallest to the largest fraction. "Can you find the three fractional pieces?" Check to see that

STRATEGY 2: cont'd

each pupil has $\frac{1}{4}$ held up. "How do you know that the $\frac{1}{4}$ is the smallest?" Elicit the response, it is the smallest strip. "Hold up the largest." Check to see that each pupil has the $\frac{1}{2}$ piece. "How do you know that the $\frac{1}{2}$ is the largest?" Elicit the response, it is the largest strip. "Which piece is in the middle?" Elicit the response, the $\frac{1}{3}$ piece is in the middle. "Now put the pieces in order. How can we also write the fractions in order from smallest to largest?" Elicit the response $\frac{1}{4}, \frac{1}{3}, \frac{1}{2}$. Write $\frac{1}{4}, \frac{1}{3}, \frac{1}{2}$ on the chalkboard. Repeat this procedure for other sets of three unit fractions, e.g., $\frac{1}{3}, \frac{1}{6}, \frac{1}{2}; \frac{1}{12}, \frac{1}{16}, \frac{1}{8}; \frac{1}{2}, \frac{1}{6}, \frac{1}{4}; \frac{1}{4}, \frac{1}{2}, \frac{1}{8}$.

4.06.02.02 order numerically three fractions from smallest to largest or largest to smallest

STRATEGY 1: Distribute fractional strips of number lines constructed in 04.06.01.01. Write two unit fractions on the chalkboard, e.g., $\frac{1}{2}$ and $\frac{1}{3}$. Ask, "Which is larger?" Elicit the response, the $\frac{1}{2}$ is larger. "How is $\frac{1}{2}$ larger?" Elicit the response that the $\frac{1}{2}$ strip is longer than the $\frac{1}{3}$ strip. Write $\frac{1}{2} > \frac{1}{3}$ on the chalkboard. Point to the inequality. "One half is larger than $\frac{1}{3}$."

Repeat this procedure for other pairs of unit fractions, e.g., $\frac{1}{6}$ and $\frac{1}{12}$; $\frac{1}{4}$ and $\frac{1}{3}$; $\frac{1}{6}$ and $\frac{1}{8}$. Write two unit fractions on the chalkboard, e.g., $\frac{1}{4}$ and $\frac{1}{6}$. Say, "Which fraction is smaller?" Elicit the

STRATEGY 1: **cont'd**

response, the $\frac{1}{6}$ is the smaller fraction. "How can you show that the $\frac{1}{6}$ is smaller with your fractional strips?" Elicit the response that the $\frac{1}{6}$ piece is shorter than the $\frac{1}{4}$ piece. Write $\frac{1}{6} < \frac{1}{4}$ on the chalkboard. "$\frac{1}{6}$ is less than $\frac{1}{4}$." Repeat this procedure for other pairs of unit fractions, e.g., $\frac{1}{3}$ and $\frac{1}{12}$; $\frac{1}{8}$ and $\frac{1}{2}$; $\frac{1}{4}$ and $\frac{1}{2}$; $\frac{1}{3}$ and $\frac{1}{12}$. Write $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{1}{3}$ on the chalkboard. "How can we put the three fractions in order from smallest to largest?" Elicit the response, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$. "Can you use your strips to show that this is the order?" Elicit the response that the fractions are ordered from least to most or from the shortest to the longest. Write $\frac{1}{4} < \frac{1}{3} < \frac{1}{2}$. Repeat this procedure for other fractions, e.g., $\frac{1}{8}$, $\frac{1}{2}$, $\frac{1}{6}$; $\frac{1}{12}$, $\frac{1}{16}$, $\frac{1}{4}$; $\frac{1}{6}$, $\frac{1}{3}$, $\frac{1}{16}$. Write $\frac{1}{12}$, $\frac{1}{8}$, $\frac{1}{16}$ on the chalkboard. "How can we put the fractions in order from largest to smallest?" Elicit the response, "$\frac{1}{8}$, $\frac{1}{12}$, $\frac{1}{16}$." "How can you show that this is true with your strips?" Elicit the response, the longest piece is the $\frac{1}{8}$, the middle size the $\frac{1}{12}$ and the shortest the $\frac{1}{16}$. Write $\frac{1}{8} > \frac{1}{12} > \frac{1}{16}$ on the chalkboard. Say, "$\frac{1}{8}$ is larger than $\frac{1}{12}$ which is larger than $\frac{1}{16}$."

STRATEGY 2:

Distribute four paper plates, a ruler and scissors to each pupil. Say, "We will make another set of materials to help us to order fractions. We want to divide one of the plates in half. How should we do it?" Elicit the response that to divide the plate in half you need to draw a line through the center of the plate. Demonstrate how to label the sections of the plates. "This plate is divided into two equal parts. How should we label each part?" Elicit the response that each part is one half and

STRATEGY 2:
cont'd

should be labeled, "$\frac{1}{2}$". Check to see that each pupil labels his/her plate correctly. Demonstrate how to cut one section from the plate which is divided into halves. "I want to cut half of the plate. What should we do?" Elicit the response that you should cut on the line. Demonstrate the procedure and check to see that each pupil follows directions. Repeat this procedure for plates divided into quarters, eighths, and sixteenths. "Take one of each size fraction." Write $\frac{1}{8}$, $\frac{1}{16}$, $\frac{1}{2}$ on the chalkboard. "These fractions are not in order. How can we arrange them from the smallest to the largest?" Elicit the response, the order is $\frac{1}{16}$, $\frac{1}{8}$, $\frac{1}{2}$. Write $\frac{1}{16} < \frac{1}{8} < \frac{1}{2}$ on the chalkboard. "How can we use the fractional parts to show that the order is correct?" Elicit the response, the $\frac{1}{16}$, $\frac{1}{8}$, and $\frac{1}{2}$ pieces, when placed one on top of the other, show a progression from the smallest piece to the largest piece. "How can we write the fractions in order from largest to smallest?" Elicit the response, $\frac{1}{2} > \frac{1}{8} > \frac{1}{16}$. "How can we show this is true using our paper plate pieces?" Elicit the response, each piece covers the succeeding piece. Repeat this procedure for $\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{8}$. "How can we put three fractions in order if we do not have fractional parts?" Elicit the response, the larger the denominator of a unit fraction, the smaller the fraction. Write $\frac{1}{5}$, $\frac{1}{2}$, $\frac{1}{3}$ on the chalkboard. "How can we arrange these fractions from smallest to largest?" Elicit the response, $\frac{1}{5}$, $\frac{1}{3}$, $\frac{1}{2}$. "How can we arrange the same three fractions from largest to smallest?" Elicit the response, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{5}$. "How can you tell that $\frac{1}{5}$ is the smallest of the three fractions?" Elicit the response, it has

STRATEGY 2: cont'd

the largest denominator. Write $\frac{1}{5} < \frac{1}{3} < \frac{1}{2}$ on the chalkboard. "How can we arrange the same three fractions from largest to smallest?" Elicit the response, $\frac{1}{2} > \frac{1}{3} > \frac{1}{5}$. "How can you tell that $\frac{1}{2}$ is the largest fraction?" Elicit the response, $\frac{1}{2}$ has the smallest denominator. Repeat this procedure for other groups of three fractions, e.g., $\frac{1}{8}, \frac{1}{6}, \frac{1}{7}$; $\frac{1}{5}, \frac{1}{4}, \frac{1}{6}$; $\frac{1}{9}, \frac{1}{3}, \frac{1}{8}$; $\frac{1}{6}, \frac{1}{7}, \frac{1}{9}$; $\frac{1}{2}, \frac{1}{10}, \frac{1}{3}$.

P.O. 4.06.02.01

NAME: ______________________ CLASS: __________ DATE: __________

Write the fractions in order from the smallest to largest.

1. $\frac{1}{3}, \frac{1}{2}, \frac{1}{4}$ $\frac{1}{4}, \frac{1}{3}, \frac{1}{2}$

2. $\frac{1}{8}, \frac{1}{2}, \frac{1}{4}$ ______________________

3. $\frac{1}{12}, \frac{1}{16}, \frac{1}{8}$ ______________________

4. $\frac{1}{3}, \frac{1}{12}, \frac{1}{4}$ ______________________

5. $\frac{1}{16}, \frac{1}{2}, \frac{1}{8}$ ______________________

6. $\frac{1}{4}, \frac{1}{3}, \frac{1}{6}$ ______________________

7. $\frac{1}{6}, \frac{1}{3}, \frac{1}{16}$ ______________________

8. $\frac{1}{2}, \frac{1}{12}, \frac{1}{16}$ ______________________

P.O. 4.06.02.02

NAME: ____________________ CLASS: ________ DATE: ________

Write the correct symbols > or < in each ☐

1. $\frac{1}{2}$ ☐ $\frac{1}{3}$ ☐ $\frac{1}{4}$

2. $\frac{1}{8}$ ☐ $\frac{1}{6}$ ☐ $\frac{1}{5}$

3. $\frac{1}{4}$ ☐ $\frac{1}{5}$ ☐ $\frac{1}{6}$

4. $\frac{1}{9}$ ☐ $\frac{1}{12}$ ☐ $\frac{1}{16}$

5. $\frac{1}{3}$ ☐ $\frac{1}{5}$ ☐ $\frac{1}{7}$

6. $\frac{1}{8}$ ☐ $\frac{1}{7}$ ☐ $\frac{1}{6}$

7. $\frac{1}{16}$ ☐ $\frac{1}{9}$ ☐ $\frac{1}{5}$

8. $\frac{1}{12}$ ☐ $\frac{1}{10}$ ☐ $\frac{1}{4}$

4.06.03 SEPARATE WHOLE OBJECTS

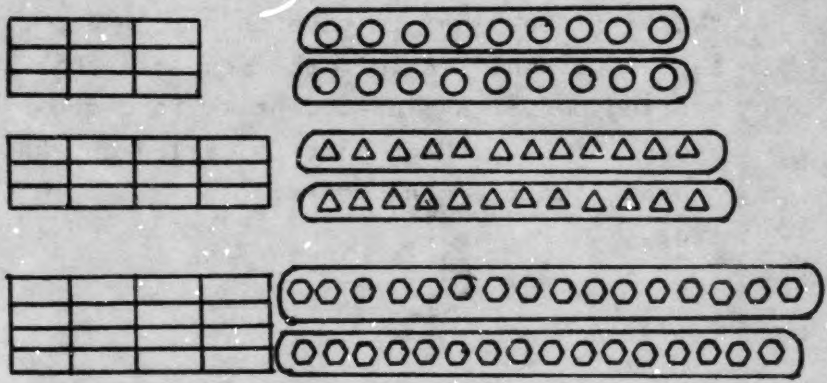
(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

4.06.03.01B identify and divide whole objects and groups of objects into ninths, twelfths and sixteenths;

e.g.,



4.06.03.02B solve word problems related to skills learned in this module.

e.g.,

Mother made a 6-foot hero sandwich for lunch. How should the sandwich be cut to feed her 12 friends? (Twelfths.)

4.06.03

VOCABULARY

TERMS

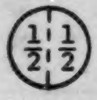
share
equal
numerator
denominator
fractional part

GETTING STARTED

"We would like two people to share a pizza pie equally. " Fold and cut a red paper circle into two unequal parts. Say, "Are these parts equal?" Elicit that the fractional parts are not equal. Fold and cut another circle into four equal parts. Show one part. Say, "Would it be equal to give this to one person and the rest to a second person?" Elicit the response that the second person would be getting more. Ask a student to fold the paper to show equal amounts. Say, "Each part is called one-half." Write the symbol for one-half on the chalkboard.

e.g.,

$\frac{1}{2}$,



Fold a rectangular piece of paper in half. Shade in one of the two parts. Write the fraction $\frac{1}{2}$ on the chalkboard. Explain that the denominator tells us that there are two equal parts. Explain that the numerator tells us that we have shaded one of the parts. Repeat this procedure for $\frac{1}{3}$ and $\frac{1}{4}$.

4.06.03

4.06.03.01 **identify and divide whole objects and groups of objects into ninths, twelfths and sixteenths**

STRATEGY 1: Distribute three 5"x8" rectangular pieces of paper to each student. Say, "Fold the first rectangle vertically into 3 equal parts , then horizontally into 3 equal parts so that there are 9 equal parts in all.

"Eddie has a stamp collection. On one of the pages, one of the stamps is a Canadian stamp, and the rest are U.S. stamps. We would like to find what fractional part of Eddie's stamps are Canadian?"

"Write a 'C' in any box to show the Canadian stamp and 'U.S.' in the other boxes. How many stamps are there in all?" Elicit the response, nine. "How many stamps are Canadian?" Elicit the response, one. Show that one stamp out of nine stamps is Canadian. "Can you come to the chalkboard to show the numerical symbol for what we just said?" After a student writes $\frac{1}{9}$, show vocabulary $\begin{array}{ll} 1 & \text{numerator} \\ \hline 9 & \text{denominator} \end{array}$. "The denominator tells us how many parts in all. The numerator tells us the number of parts we are talking about." Repeat this procedure for $\frac{5}{9}$.

Say, "Cut or tear along the folds so that there are now 9 separate pieces. How many parts in all? (9.) How many parts are Canadian?" (1.) Show that one out of 9 parts are Canadian. Ask a student to write the numerical symbol for one ninth: $\frac{1}{9}$.

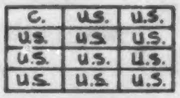
With the other 2 rectangles, repeat this procedure

4.06.03

STRATEGY 1: cont'd

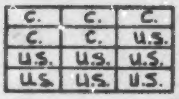
for $\frac{1}{12}$ (1)

(2)



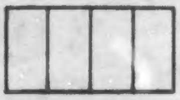
c.	u.s.	u.s.
u.s.	u.s.	u.s.
u.s.	u.s.	u.s.
u.s.	u.s.	u.s.

; $\frac{5}{12}$



c.	c.	c.
c.	c.	u.s.
u.s.	u.s.	u.s.
u.s.	u.s.	u.s.

$\frac{1}{16}$ (1)



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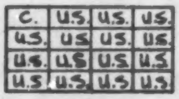
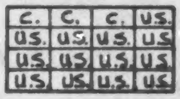


c.	u.s.	u.s.	u.s.
u.s.	u.s.	u.s.	u.s.
u.s.	u.s.	u.s.	u.s.
u.s.	u.s.	u.s.	u.s.

; $\frac{3}{16}$



c.	c.	c.	u.s.
u.s.	u.s.	u.s.	u.s.
u.s.	u.s.	u.s.	u.s.
u.s.	u.s.	u.s.	u.s.

Say, "Identify fractional parts. Show us five sixteenths of the stamps", "Show us nine sixteenths of the stamps, ..."

STRATEGY 2: Distribute to each student 9 unifix or interlocking cubes and a few small bingo chips or counters.

Say, "There are 9 cookies in a box. One cookie has frosting. What part of the box has frosting?" Ask students to place a chip on the cookie that has frosting.

"How many parts (cookies) in all?" (9.)

"How many have frosting?" (1.)

Show that one part out of 9 equal parts has frosting.

"How can we write a numerical symbol for one part out of 9 equal parts?"

Ask a students to come to the chalkboard to show this: $\frac{1}{9}$.

Repeat this procedure, with students using 4 chips to show four ninths, 7 chips to show seven ninths. Each time a symbol is written, such as $\frac{4}{9}$, write the words $\frac{\text{4 numerator}}{\text{9 denominator}}$.

Reinforce that the denominator tells how many equal parts there are in all. The numerator tells

STRATEGY 2: cont'd

the number of parts that we are talking about (the number of cookies frosted, in this example.)

The students will then separate the unifix cubes to show a group on nine objects. They will place chips on 2 parts out of 9 to show $\frac{2}{9}$.

Repeat this procedure with 12 cubes, then 16 cubes $(\frac{1}{12}, \frac{5}{12})$; $(\frac{3}{16}, \frac{7}{16}, \ldots)$

Ask students to identify fractional parts. "Show us $\frac{5}{16}$ of the cookies, $\frac{11}{16}$ of the cookies, ..."

4.06.03.02 **solve word problems related to skills learned in this module**

STRATEGY 1:

Say, "There were 9 youngsters at Susan's birthday party. How should Mother cut the cake?" Show students a brown sheet of construction paper to represent the cake. "If this was the cake, how should we cut it to have enough for 9 youngsters?" Elicit the response, "We should cut the cake into ninths."

Say, "There were 12 eggs in a box. Mother doesn't need to use the whole box. What part of the box is one egg?" Elicit that one egg is one part out of twelve. "The box is divided into twelfths. One egg is one-twelfth."

Say, "Sandra's mother baked brownies for a cake sale. How should she cut the sheet of brownies to have enough for sixteen pieces." Elicit the response, she has to cut this into sixteenths. Each piece is called one-sixteenth.

STRATEGY 2: Distribute 5 index cards to each row of students. Each card has a problem written on it, pertaining ninths, twelfths, sixteenths. Ask each row of students to get together to solve their problem.

Ask a student in row 1 to read the problem on the card. A student reads, "Nine players are on a team. The manager wants them to take their places on the field. How shall he divide them?" Elicit the response, he should divide them into ninths. Each player is one ninth of the whole team.

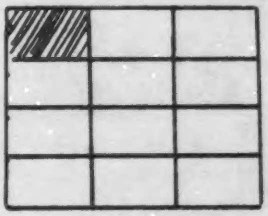
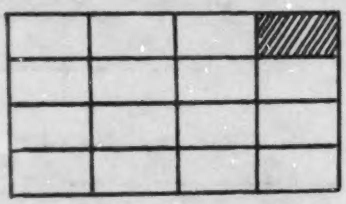
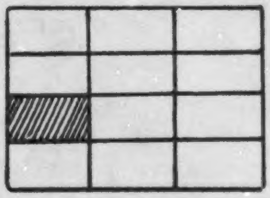
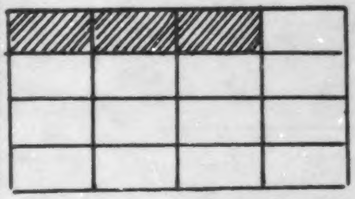
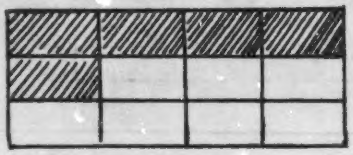
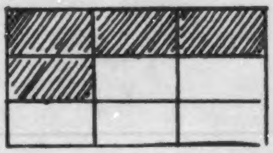
Ask a student in row 2 to read, "Jerry has a ruler with 12 inches on it. How is this ruler divided?" Elicit the response, it is divided into twelfths. Each inch is one twelfth of the whole ruler.

Ask a third student to read, "On Frankie's ruler, each inch has 16 markings. How would you say the inch is divided?" Elicit the response, it is divided into sixteenths. Repeat this procedure for the remaining 2 rows.

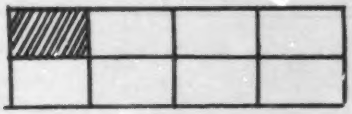
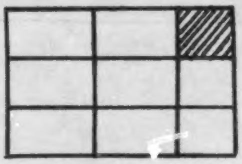
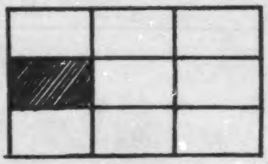
P.O.4.06.03.01

NAME:____ CLASS:__________ DATE:________

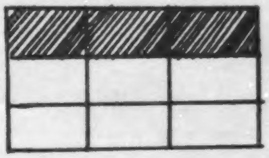
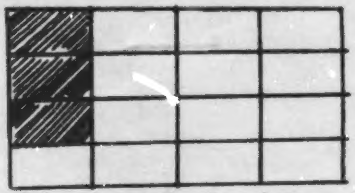
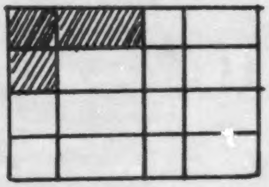
1. What fractional part is shaded?

2. a. Which rectangle shows one ninth?

b. Which shows three sixteenths?

3. Can you divide this rectangle into a equal parts? Color 4 parts to show 4/9.

NAME:____ CLASS:_________ DATE:_______

4. Divide this line segment into 16 equal parts.
   Circle 3 parts out of 16.

0______________________________0

5. Divide this box of eggs into 12 equal parts.
   Circle 5 parts.

0 0 0 0 0 0
0 0 0 0 0 0

P.O. 4.06.03.02

NAME: ____________________ CLASS: ________ DATE: ________

Solve these word problems.

1. How should a birthday cake be cut if 9 children are at a birthday party?

   ninths

2. How should a banana be divided if there are 12 monkeys? __________

3. Mother bought some material to make sashes for the girls costumes in a play. 16 girls will be in the play. How will mother cut the material? __________

4. When mother buys eggs; how is the dozen of eggs divided? __________

5. At the pizza party, Wanda's father ordered a large pizza for 16 girls. How should the pizza be divided up? __________

6. Sam is making sheets for a calendar from a large oak tag chart. How should she divide the whole chart to have enough sheets for 1 year? __________

7. Bruce has a ruler with 16 markings between inches. How is the ruler divided up? __________

8. How should the chairs in the auditorium be divided so that there will be 9 rows? __________

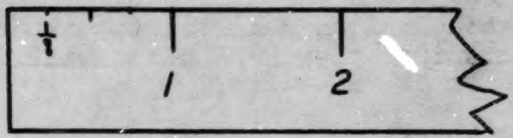
Unit 24

4.10.02 LINEAR MEASUREMENT

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.10.02.01B	identify $\frac{1}{8}$ inch on the ruler; e.g., 
4.10.02.02A	identify mile as a customary measure of distance; e.g., Stanley walked two miles to the train station.
4.10.02.03A	identify the relationships among inch, foot, yard and mile; e.g., 12 inches = 1 foot 3 feet = 1 yard 5280 feet = 1 mile 1760 yards = 1 mile
4.10.02.04A	identify kilometer as a metric measure of distance. e.g., David drove 80 kilometers in an hour.

4.10.02

VOCABULARY

TERMS	SYMBOLS
inch	", in.
foot	', ft.
yard	yd.
mile	mi.
kilometer	km.

GETTING STARTED

Measure several objects in the classroom, e.g., student's desk, the height of the door, the length of the bulletin board,... using a nonstandard unit such as a pencil, a hand or a piece of string.

Ask the students to measure and record their findings on the following chart:

Unit of Measure Used = Tom's Pencil

Student desk _____ pencils
Door _____ pencils
Bulletin board _____ pencils

Ask a student to complete the chart with the unit of measure used and the various lengths in terms of that unit. Repeat this procedure by having several other students record their results, using their own pencil as the unit of measure.

Discuss the results and the reasons why the measurements differed from student to student.
e.g., different size pencils were used, students have different size hands, pieces of string were not the same length,...

Ask, "What are some common units of measurement?" Elicit that some common units are inches, feet, yards...

Distribute 12" rulers and yardsticks for students to examine. Show the relationship between an inch and a foot, a foot and a yard.

GETTING STARTED cont'd

Ask the students to determine body measurements that approximate an inch, a foot and a yard.

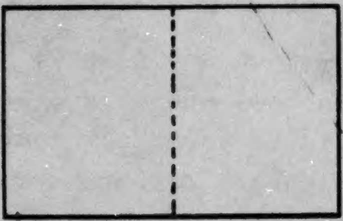
e.g., A part of a finger or the nose is an approximation of an inch, the width of both hands or the forearm is about a foot, and the distance between outstretched arms is approximately a yard.

Say, "Use the body measurements as guides to estimate the lengths of various objects around the room. Record these estimates and then check the estimates with a 12" ruler or yardstick."

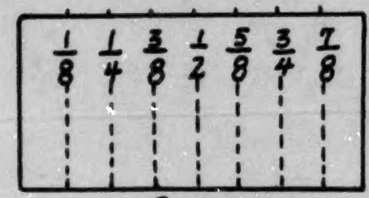
4.10.02

4.10.02.01 **identify $\frac{1}{8}$ inch on the ruler**

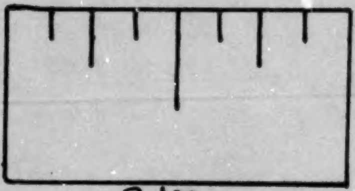
STRATEGY 1: Distribute a sheet of unlined paper and a ruler marked in eighth of an inch to each student. Have the students fold the paper in half and then reopen it.



Ask, "What does this line (crease) in the middle of the paper represent?" Elicit the response: This line represents $\frac{1}{2}$ of the paper. Ask the students to label the line "$\frac{1}{2}$". Then ask the students to fold the paper in half again. After determining that the new line denotes $\frac{1}{4}$ of the paper, have the students label the new line as "$\frac{1}{4}$". Repeat the procedure of folding the paper one more time to show $\frac{1}{8}$ of the paper. Ask the students to compare their labeled paper to the first inch of the ruler.



Paper



Ruler

Explain that it is feasible to label the parts of an inch as we did for the paper so we must identify the parts of an inch by the fractional lines provided. Have the students use the labeled paper to identify the $\frac{1}{2}$" line, the $\frac{1}{4}$ inch line and finally the $\frac{1}{8}$ inch line and discuss how this can

4.10.02

STRATEGY 1: cont'd

help us use the ruler more effectively. Label the remainder of the parts. ($\frac{3}{8}$, $\frac{5}{8}$, $\frac{7}{8}$...) Ask the students to find objects that measure approximately $\frac{1}{8}$ of an inch; e.g. the thickness of the ruler.

STRATEGY 2:

Display an assortment of scraps of wood or cardboard of varying thicknesses; e.g. one inch, $\frac{1}{2}$ inch, $\frac{1}{4}$ inch and $\frac{1}{8}$ inch. Four 6-inch rulers marked in $\frac{1}{2}$ inches, one marked in $\frac{1}{8}$ inches. Ask the students to use their inch-marked ruler to measure the thickness of each scrap. They should notice that only the one inch thick scrap can accurately be measured with this ruler. The rest can be described as less than one inch. Introduce the $\frac{1}{2}$ inch-marked ruler and explain that when an inch is marked into two equal parts, we can measure in half inches. The students will now be able to accurately measure the half-inch thick wood. Repeat this procedure by using the $\frac{1}{4}$ inch-marked ruler and the $\frac{1}{8}$ inch-marked ruler. Reinforce that when an inch is marked into eight equal parts, we measure in eighths of an inch.

Helpful Hint: These rulers can be duplicated on one rexograph sheet and cut out for use by students. For extended use paste the rulers on oaktag paper.

4.10.02.02 identify mile as a customary measure of distance

STRATEGY 1:

Say, "Some distances are so large that it is necessary to use the mile rather than the inch, the foot or the yard to measure them." Take the class

STRATEGY 1: cont'd

on a walk around the school block. While taking this walk have a few students use a watch to determine how much time was needed to walk the sides of the block. Have a student use a yard trundle wheel to count the number of yards walked. Say, "You would have to walk around the block about 5 times in order to walk about one mile. Ask the students to determine about how many blocks make a mile. Next, discuss how long it took to walk around the block and have the students determine how long it would take to walk a mile. Using the trundle wheel measurement for the 4 blocks walked, ask the students to determine approximately how many yards are in a mile by multiplying their results by 5. Repeat this to determine how many feet are in a mile. Explain that one mile is equal to 1,760 yards or 5,280 feet. Compare the class estimates to these and discuss why they do not match exactly.

STRATEGY 2: Hang a local or city map in front of the room. Using the map to discuss familiar places the class has recently visited. Ask, "Could we walk there? How long do you think it would take to walk there? How long would it take to drive there?..." Introduce the term 'mile' to the class and say that it is used to measure large distances. Say, "A mile is approximately 20 blocks." Write the list of familiar places on the chalkboard and using the map write the distance in miles from the school next to each place.

e.g.,

Coney island	9 miles
Staten Island Zoo	18 miles
Kennedy Airport	7 miles
IRT Subway	1 mile

4.10.02

STRATEGY 2: cont'd

Ask the students to list places, streets... that are approximately one mile from the school.

4.10.02.03 **identify the relationships among inch, foot, yard and mile**

STRATEGY 1:

Distribute strips of 12-inch oaktag and a one square-inch oaktag. Say, "Use the square-inch oaktag to mark off an inch at a time on the strip." Ask the students to compare it to regular rulers. Make a yardstick by joining 3-foot rulers. Ask the students to use the rulers they made to help them complete the following chart.

1 foot = ____ inches
1 yard = ____ inches
1 yard = ____ feet
1 mile = ____ feet
1 mile = 1760 yards

STRATEGY 2:

Make ten 3-inch by 10-inch strips of oaktag with the following measurements on them:

36 inches	36"
1,760 yards	1,760 yds
3 feet	3'
5,280 feet	5,280'
12 inches	12"

Place a strip of masking tape behind each strip so that it may be placed on the chalkboard. Write the following units of measurement on the chalkboard

4.10.02

STRATEGY 2: cont'd

and discuss when we would want to use a particular unit.

1 foot
1 yard
1 yard
1 mile
1 mile

e.g., We would use inches to measure small items such as pencils or book lengths; feet are useful to measure lengths of walls, distance between bases; yards are used in football and races; miles are for distances usually too far to walk. Explain that all these units of measurement are related and we can determine these relationships by using a foot ruler and a yardstick. Ask a student to come to the chalkboard and find an oaktag strip that gives a measurement that is equivalent to one foot and place it next to it on the chalkboard. Repeat this procedure until each unit has an equivalent measurement strip and an equivalent measurement abbreviation next to it.

4.10.02.04 **identify kilometer as a metric measure of distance**

STRATEGY 1: Say, "In most countries the kilometer is used rather than the mile to measure large distances." Distribute meter sticks to the students. Take the class to the schoolyard or the front of the school building to mark off 100 meters which is roughly a full block. Introduce kilometer as measurement of distance which is equal to 1,000 meters or 10 times

327

STRATEGY 1: cont'd the distance they walked off outside. Ask the students to determine approximately how many blocks would be equivalent to a kilometer. Compile a list of places, streets... that are approximately one km from the school.

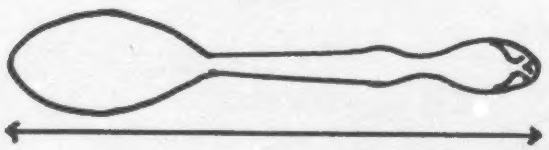
STRATEGY 2: Show a local street map to the class and display a meter stick. Reinforce that the meter is the basic unit of length/distance measurement in the metric system, used by many countries. Say, "Longer distances are measured in kilometers (1,000 meters)." Give examples of a kilometer; e.g. about 10 city blocks, the distance from the school to some student's house, about the length of 10 football fields... Using the local map to discuss familiar distances in terms of kilometers. List as many places as possible on the chalkboard and their approximate distances in kilometers from the school.

P.O. 4.10.02.01

NAME:____________________ CLASS:________ DATE:________

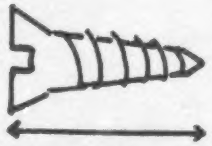
Write a ✓ on the line next to the measurement that best describes the length of each item. Use your ruler.

1)



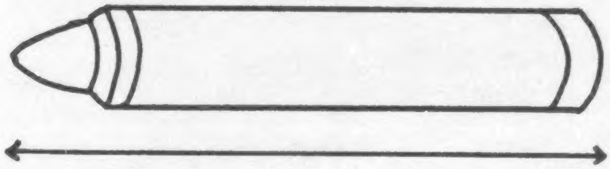
____ 3 inches
____ 3 1/8 inches
____ 3 1/2 inches

2)



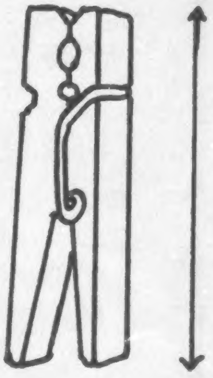
____ 1 inches
____ 1 1/8 inches
____ 2 inches

3)



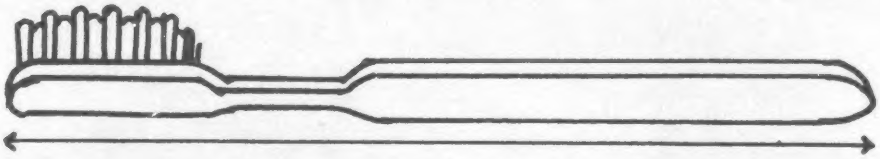
____ 3 inches
____ 3 1/8 inches
____ 3 1/2 inches

4)



____ 1 1/8 inches
____ 2 1/8 inches
____ 3 1/8 inches

5)



____ 5 1/8 inches
____ 5 1/2 inches
____ 6 1/8 inches

P.O. 4.10.02.02

NAME:____CLASS:_________DATE:_______

Fill in the blanks with the measurement that best completes each sentence. (Hint: Use each distance only once.)

1 mile

55 miles

70 miles

50 feet

400 miles

2 yards

20 miles

100 yards

1. Henry lives in the house right next to the school. He only has to walk about 50 feet to school every day.
2. The speed limit in New York is ________________per hour.
3. Mr. Gordon got a speeding ticket because he was driving_______ per hour.
4. Ann bought ________________of cloth to make a pair of slacks for herself.
5. Any student who lives more than ____________from the school is entitled to a free bus pass.
6. The length of a football field is_______________.
7. The distance from New York City to Niagara Falls, Canada is approximately___________.
8. Mrs. Walker lives on Staten Island. She drives approximately ________________to school every day.

P.O. 4.10.02.03

NAME:____ CLASS:__________ DATE:________

Complete each chart.
Complete each sentence using the word inches, feet, yards or miles.

I. Complete each chart.

(1.)

FEET	1	2	3	4
INCHES	12			

(2.)

YARDS	1	2	3	4
FEET	3			

(3.)

YARDS	1	2	3	4
INCHES	36			

(4.)

MILES	1	
YARDS	1760	

II.

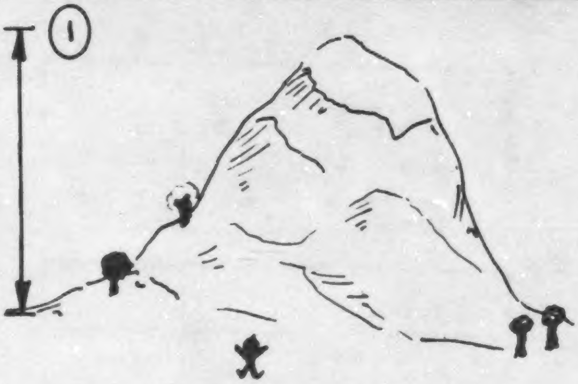
1. The birthday cake is 8_______ across.
2. Our front door is 7________ high.
3. Mr. Smith is about 2_____ tall.
4. The distance from New York to Florida is about 1000_______.
5. My father drives about 20____ to work every day.
6. The classroom is about 20______ long.
7. A mouse is about 3_______ long.
8. A child's foot is about 6_______ long.
9. A football field is 100 ______ long.
10. John comes to school by bus because he lives 3__________ away.
11. A bicycle is about 3 ______ long.

P.O. 4.10.02.04

NAME:________________________ CLASS:________ DATE:________

Choose the measurement that best describes the length shown.

①

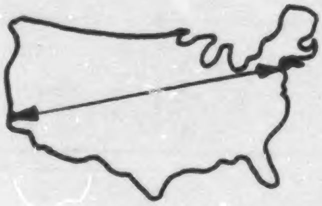


1 meter

10 meters

1 kilometer

②

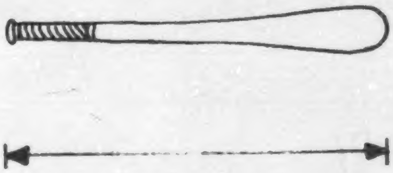


50 meters

50 kilometers

5000 kilometers

③

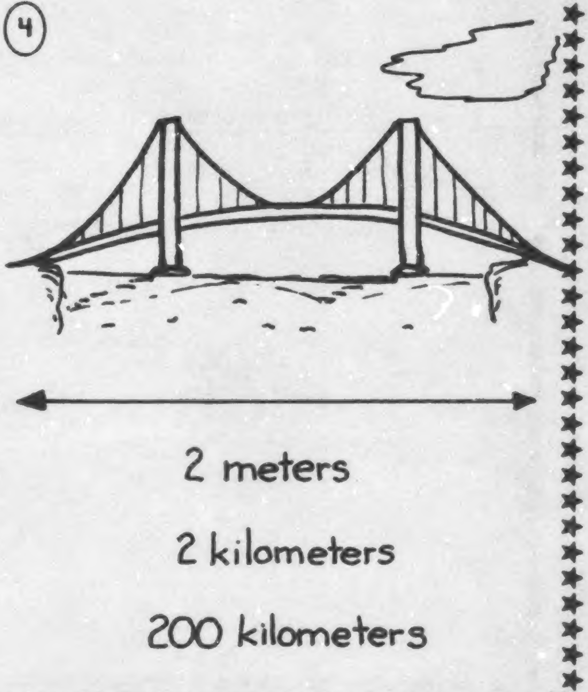


1 meter

10 meters

1 kilometer

④



2 meters

2 kilometers

200 kilometers

Unit 25

4.01.03 EVEN AND ODD PATTERNS WITH ADDITION AND SUBTRACTION

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.01.03.01A define an odd number as a number that is 1 + an even number;

e.g.,

1 + 2 = 3

therefore, 3 is an odd number.

4.01.03.02A answer questions pertaining to an addition chart;

e.g.,

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9	10
2	2	3	4	5	6	7	8	9	10	11
3	3	4	5	6	7	8	9	10	11	12
4	4	5	6	7	8	9	10	11	12	13
5	5	6	7	8	9	10	11	12	13	14
6	6	7	8	9	10	11	12	13	14	15
7	7	8	9	10	11	12	13	14	15	16
8	8	9	10	11	12	13	14	15	16	17
9	9	10	11	12	13	14	15	16	17	18

A. How many sums are there in the addition table? 100

B. How many of the sums are even numbers? 50

C. How many of the sums are odd numbers? 50

D. What kind of number does an even and an even number give? Even

E. What kind of number does an odd number and an odd number give? Even

F. What kind of number does an odd and even number give? Odd

4.01.03.03A answer questions pertaining to the differences of subtraction problems.

e.g.,

A. What kind of number does an even number subtracted from an even number give even? Even

B. What kind of number does an odd number subtracted from an even number give? Odd

4.01.03

VOCABULARY

TERMS

even
odd
share

GETTING STARTED

Show seven discs. Say, "I want to share these equally with my best pal. How should I do this?" Ask students to make two even piles. Elicit the response, "It can't be done. Seven is not an even number. It is odd." Repeat procedure using other quantities of discs. Ask students to test if a given number is even or odd by moving real objects and forming equal piles.

Ask students to write 0-100 on hundred chart. Circle all the odd numbers. Place a square around all even numbers. Ask, "Are there any numbers that are not odd or even?" (No) What patterns do you see?" Elicit the response that every other number is odd or even. Direct the students attention to the chart. Elicit that all the circles line up, and all the squares line up. Say, "What digit is in the ones place for even numbers? (2, 4, 6, 8) for odd numbers? (1, 3, 5, 7, 9)."

e.g.,

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99
100 ...									

4.01.03

4.01.03.01 **define an odd number as a number that is one + an even number**

STRATEGY 1: Say, "An even number can be divided into two equal parts. If you and your pal have the same number of candies, you have shared them equally. You both have the same amount." Show how 12 candies can be shared. Ask a student to write 4 even numbers on the chalkboard, e.g., 16, 8, 52, 10.
Ask, "What would happen if you got one more candy?" Add one candy to 12 candies. 13 candies could not be equally shared." Ask the students to test their numbers. Elicit the response, "There will be one extra candy." Say, "An even number plus one more equals an odd number. An odd number cannot be divided into two equal parts."

STRATEGY 2: Distribute numberline strips to each student. Ask students to fill in number line 0 to 40. "Put a square around each even number." Ask, "Do you notice a pattern with even numbers?" Elicit the response, "You are skipping a number each time." Draw arrows to illustrate the "skip".

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15....

Say the number you skipped is odd. Circle it. Ask, "How much larger is odd 3 than even 2, odd 9 than even 8, ...?" Elicit the response, the odd number is one greater than the even number. Show on number line that if you start at an even number and add one you land on an odd number.

4.01.03

4.01.03.02 **answer questions pertaining to an addition chart**

STRATEGY 1: Show this addition chart.

e.g.,

+	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										

Write the following on chalkboard.

even + even =

odd + odd =

even + odd =

Ask students to fill in sums on chart. Say, "Let's use the chart to find out answers to the questions on the chalkboard. Are 6 and 2 even or odd addends? (even) What is the sum of 6 and 2? (8) Is that number odd or even?" (even) Ask a student to pick out 2 even addends on chart. Ask, "Is the sum odd or even? (even) What is the sum of two even numbers?" (even) Place "even" in answer box.

Say, "Now let's try out two odd numbers, e.g., 3, 5. What is the sum? (8) Is it odd or even?" (even) Let students test out 2 odd numbers. Elicit the response, "odd + odd = even." Fill in answer box on chalkboard. Repeat procedure with even + odd addend, e.g., 6 + 1. Fill in "odd" in the answer box for the example, even + odd = odd.

4.01.03

STRATEGY 2: Show addition chart. Ask students to fill in sums and circle each odd sum and place a square around each even sum. Mark addends with circle (odd) and square (even).

Ask what happens when you add □ + □ =
○ + ○ =
□ + ○ =
○ + □ =

Use chart to demonstrate and show that an even □ + an even □ = even □; odd ○ + odd ○ = even □; even □ + odd ○ = odd ○; odd ○ + even □ = odd ○.

P.O. 4.01.03.01

NAME:______________________________ CLASS:________ DATE:________

Complete the number chart from 100 to 200. Circle the odd numbers. Place a square around the even numbers.

100	101	102	103	104	105	106	107	108	109
110	111								

Write odd or even next to each addend in the ( ).

6 (even) + 1 = 7 (odd)

12 ( ) + 1 = 13 ( )

26 ( ) + 1 = ( )

324 ( ) + 1 = ( )

2,320 ( ) + 1 = ( )

5,762 ( ) + 1 = ( )

P.O. 4.01.03.02

NAME: ____________________ CLASS: ________ DATE: ________

Complete the chart. Draw a circle around odd numbers and a square around even numbers.

+	$\boxed{6}$	$\boxed{10}$	⑤	⑦	$\boxed{0}$
③					
$\boxed{4}$					
$\boxed{2}$					
①					
$\boxed{8}$					
$\boxed{10}$					

Use the chart to complete the sentences.

□ + □ = ______ even + even = ______

○ + ○ = ______ odd + odd = ______

□ + ○ = ______ even + odd = ______

○ + □ = ______ odd + even = ______

P.O. 4.01.03.03

NAME: ______________________ CLASS: ________ DATE: _______

(1)	20	14	24	32
	- 7	- 9	- 5	- 11

We are subtracting an odd number from an even number. Will our answer be even or odd? ______

Do the examples to check your guess.

Make up your own examples -- does the rule always apply? ______

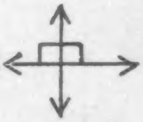
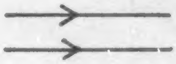
(2)	20	30	16	36
	- 14	- 12	- 8	- 24

We are subtracting two (2) even numbers. Will your answer be odd or even? ______

Do the examples to check your guess.

Make up your own examples -- does the rule always apply? ______

TABLE OF SYMBOLS

DEFINITIONS	SYMBOL	DEFINITIONS	SYMBOL
plus; add; positive	+	line	$\longleftrightarrow$
minus; subtract; negative	-	ray	$\longrightarrow$
plus or minus	+ or -	perpendicular lines	
times; multiply	· or X	parallel lines	
divide	÷	degree	°
divide	$\overline{)}$	equals	=
square root	$\sqrt{}$	is not equal to	≠
cube root	$\sqrt[3]{}$	is less than	<
angle	∢	is greater than	>
between two numerals or letters at the end of a series or sequence; and so on	...	encloses a set when numbers are included: empty set when empty	{ }
		subset	⊂
triangle	△	intersection	∩
rectangle	▭	union; join	∪
parallelogram	▱	percent	%
circle	⊙	foot, minute	'
		inch, second	"
line segment (as $\overline{AB}$)	—		

METRIC TABLE

PREFIX	VALUE	LENGTH	CAPACITY	WEIGHT (MASS)
KILO	1000	kilometer* (km)	kiloliter (kl)	kilogram* (kg)
HECTO	100	hectometer (hm)	hectoliter (hl)	hectogram (hg)
DEKA	10	dekameter (dam)	dekaliter (dal)	dekagram (dag)
	1	meter* (m)	liter* (l)	gram* (g)
DECI	$\frac{1}{10}$ or .10	decimeter (dm)	deciliter (dl)	decigram (dg)
CENTI	$\frac{1}{100}$ or .01	centimeter* (cm)	centiliter (cl)	centigram (cg)
MILLI	$\frac{1}{1000}$ or .001	millimeter* (mm)	milliliter (ml)	milligram* (mg)

* most frequently used

BASIC CLASSROOM EQUIPMENT CHECKLIST

MATERIALS:

Abacus - Class size/individual. ____

Attribute blocks................ ____

Balance Beam.................... ____

Calculators..................... ____

Calendar - class size........... ____

Clock - large - class size...... ____

Clock - individual size......... ____

Clock - stamp................... ____

Coin stamps..................... ____

Compass......................... ____

Cubic counting blocks........... ____

Cuisenaire rods................. ____

Dominoes........................ ____

Felt cut-outs................... ____

Flannel board................... ____

Flash cards..................... ____

Fractional parts (assorted)..... ____

Geo boards...................... ____

Geometric patterns.............. ____

Hundred charts - class size/ind. ____

Laminating paper................ ____

Magnetic board.................. ____

Magnetic discs.................. ____

Measuring tools-English, Metric (rulers, scales, compasses, protractors, beakers, cups, spoons, thermometers)........ ____

Number lines - class/individual. ____

Numerals - tactile.............. ____

Plastic discs................... ____

Play money...................... ____

Powers of Ten................... ____

Protractor...................... ____

SEE calculators................. ____

Scale........................... ____

Screen (pull-down type)......... ____

Spinners........................ ____

Squared place value material.... ____

Standard playing cards.......... ____

Tangrams........................ ____

Tens frame...................... ____

Timers (1,2,3 minute)........... ____

Tokens (various sizes/colors)... ____

Trundle wheel................... ____

Unifix cubes.................... ____

Unifix 100 board................ ____

SUPPLIES:

Adding machine tapes (for classroom/ind. number lines)...... ____

Chalk........................... ____

Construction paper.............. ____

Elastic bands................... ____

BASIC CLASSROOM EQUIPMENT CHECKLIST

SUPPLIES: cont'd

Envelopes (all sizes).......... ____
Erasers, board/individual...... ____
Felt pens (all sizes).......... ____
Ditto, Rexograph paper......... ____
Glue........................... ____
Gram weights................... ____
Graph paper (1 cm, <, 1")...... ____
Grease pencils................. ____
Oak tag........................ ____
Paper clips.................... ____
Paste.......................... ____
Plastic discs.................. ____
Pointer........................ ____
Primary pencils................ ____
Rubber bands................... ____
Scissors - primary, left hand.. ____
Scotch tape.................... ____
Spinner........................ ____
String......................... ____
Tape........................... ____

COLLECTIBLES:

Beads and beans................ ____
Bottle caps.................... ____
Buttons........................ ____
Cardboard (all sizes).......... ____
Cereal boxes................... ____
Coffee cans.................... ____
Detergent boxes, shoe boxes, meat trays, and plastic containers................... ____
Egg cartons.................... ____
Felt for desk mats............. ____
Ice cream sticks............... ____
Juice containers............... ____
Macaroni....................... ____
Magazines...................... ____
Menus.......................... ____
Metrically measured cartons.... ____
Milk containers................ ____
Newspapers..................... ____
Paper plates................... ____
Sand........................... ____
Spools......................... ____
String, yarn................... ____
Styrofoam...................... ____
Tongue depressors.............. ____
Wire hangers................... ____
Ziploc Bags.................... ____